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CONTENTS.

An Asterisk (*) denotes an illustrated article.

NOTICE—

Thirty-first Annual Meeting, American Gas Light Association..... 561

EDITORIALS—

Briefly Told..... 562

The Detroit Meeting of the American Gas Light Association—Death of Thomas Fletcher—Notes.

Eleventh Annual Meeting, Pacific Coast Gas Association—Report of Proceedings—Concluded from Page 527..... 562

Second Day—Afternoon Session—Experience Department—Permanent Headquarters—Report from the Committee on President's Addsess—Report of the Committee on Obituary—Election of Officers—Responses—Votes of Thanks—Adjournment.

Messrs. A. C. Humphreys, H. L. Doherty, Irvin Butterworth and the Dellwik Process..... 564

The Outlook for the College Man..... 567

The Attitude of Trades Unions Toward Trade Schools, by Mr. W. H. Sayward..... 567

Liquid Fuel..... 569

Electrical Progress in Egypt..... 570

A Word to Exporters..... 572

ITEMS OF INTEREST FROM VARIOUS LOCALITIES..... 572

Promotion for Mr. L. J. Hoke—Changes at Schenectady, N. Y.—Death of Mr. C. A. Sweet—Personal—The Madison (Wis.) Franchise—Death of Mr. J. H. Cowell—The Lighting Supply of Belfast, Me.—Dearer Gas for Wilkes-Barre, Pa.—A Big Coke Oven Enterprise—Another Phase of the Bay State Gas Litigation—Something from Westerly, R. I.—Mr. M. J. Higley Goes to Iowa City, Ia.—A Hint from Fall River, Mass.—The Bloomington (Ills.) Company in New Office Quarters—The Proposed Gas Works for Guthrie, Okla.—And Many Other Items.

The Market for Gas Securities..... 574

[GENERAL ANNOUNCEMENT.]

THIRTY-FIRST ANNUAL MEETING, AMERICAN GAS LIGHT ASSOCIATION.

AMERICAN GAS LIGHT ASSOCIATION,
OFFICE OF THE SECRETARY,
58 WILLIAM STREET, N. Y. CITY,
September 16, 1903.

There will be an annual meeting of the American Gas Light Association held at Detroit, Mich., October 21st to 23d, 1903.

The meeting will be called to order by the President, Alten S. Miller, of Baltimore, Md., at 10 A.M., Wednesday, October 21st.

The meeting place will be in Masonic Hall, corner Lafayette avenue and First street.

The headquarters will be in the Russell House, Detroit, Mich.

The most satisfactory quarters are always obtained by writing in advance to the hotel people, and in doing so a reply should be requested, for which a self-addressed, stamped envelope should be inclosed, as misunderstandings may be averted.

The Russell House is conducted on both the American and European plans, and the rates for rooms will be as follows:

American Plan: Rooms without bath, $3 per day for each person; rooms with bath, $4 per day for one person, or $7 per day for two persons ($3.50 per day for each person) and upward. European Plan: Rooms without bath $1.50 per day for each person; rooms with bath, $2.50 per day for each person, and upward.

Another hotel is the Cadillac, which is not far from the Russell House, and the rates of which are about 50 cents per day higher than those quoted by the Russell House.

The roll call will be made by means of the door card system. Each member upon entering the hall for the first time will, at the door, receive a special card upon which he will find his name, address, etc., as it appears on the Secretary's books, and such card should be corrected and given to the doorkeeper. Members in attendance should attend to this very carefully, as these cards are used immediately after the meeting for correcting the annual membership list. Visitors will please hand to the doorkeeper their personal cards.

A blank form of application for membership accompanies this circular. More can be obtained of the Secretary.

Remember, all applications must be in the hands of the Secretary by October 11th, at the very latest, otherwise they will not be acted upon at this meeting.

The list of papers to be read at the meeting is as follows:

"Our Correspondence School," by Mr. Alex. C. Humphreys, New York City.

"Gas Enrichment from a London Standpoint," by Mr. Arthur G. Glasgow.

"Municipal Ownership," by Mr. H. L. Doherty.

"Notes on the Operation of Large Carburetted Water Gas Sets," by Mr. W. Cullen Morris, New York City.

"Lecture on Gas Engines," by Prof. Alfred H. White, of the University of Michigan.

The Committee on Electrolysis will present a report containing recommendations as to the measures to be adopted to reduce the trouble from this cause to a minimum. It is hoped and expected that those recommendations will be thoroughly discussed.

If the papers are of a sufficiently high standard, the Beal medal will be awarded to the author of the best paper presented, the question of which is best to be decided by the proper committee.

During the days of the meeting all the announcements will be posted on the bulletin boards at the headquarters and meeting hall. All members are warned to take notice thereof accordingly.

All members attending the meeting are particularly requested to wear their membership badges in plain sight, thereby greatly aiding the officers and the local committee in their work, by affording a ready means of recognition.

In order that the year book containing the report of this meeting may be published and issued to the members immediately after the

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meeting, notice is hereby given that, if any of the speakers at this meeting desire to correct their remarks before they are printed, they will be given an opportunity before leaving Detroit, but not after. The stenographer will have typewritten copy of the principal discussions prepared at the headquarters between the sessions of the meeting, and all those who desire to correct their remarks must notify the Secretary at the close of the session at which such remarks are made, as all the reports will be turned in to the printer immediately after the adjournment of the meeting.

Special.—The entertainment will include a smoker Wednesday evening, a banquet on Thursday evening, and a steamboat excursion on Friday. The boat will stop at various points of interest. For the ladies there will be a theater party on Wednesday evening, and the banquet and excursion as above. The price of tickets for each person will be $5. It will be necessary for members to procure a ticket for each lady accompanying them. Please fill out and mail to the Secretary at once the inclosed postal card, so that the Committee of Arrangements may know how many are to be taken care of. A. E. Forstall, Sec.

BRIEFLY TOLD.

The Detroit Meeting of the American Gas Light Association.—Secretary Forstall's current notice respecting the 31st annual meeting of the American Gas Light Association shows that all the preliminaries thereto have been completed. The committee in charge of the local matters finally decided upon Masonic Hall as the place for holding the sessions, and while it may not be claimed that the named place is not up to every purpose of a meeting hall, it is nevertheless quite a distance from the Russell House headquarters. However, that is not a fatal or even a disturbing factor. The paper list is completed, and the satisfactory announcement is made that Prof. White, of the University of Michigan, has agreed to lecture the Association on the subject of gas engines—a topic that his experience therewith enables him to speak by the book. The meeting promises to be well attended, for we have absolute knowledge regarding the purpose of 50 delegates from this section of the country to visit Detroit on the named days. We may also safely assert that the additions this year to the rolls will count as a record. The railroad companies have granted the usual concessions, and in connection with the transportation it is worthy of note that the Michigan Central Railroad has agreed to give to those who travel on its lines to the meeting a stopover privilege of 10 days at Niagara Falls and vicinity on the return.

Death of Thomas Fletcher.—Recent advices from England chronicle the death, at his residence, Grappenhall, near Warrington, England, the afternoon of Sunday, September 20th, of Mr. Thomas Fletcher, known the world over for his active and useful, scientific and commercial connection with the manufacture of appliances for cooking and heating by gas. He was born in Kirkhams, near Manchester, in 1840, and finally elected to follow the profession of dentistry, for which he was fitted by study under Doctor Henry Planck, formerly Dean of the Dental School, Victoria University. During his practice as a dentist he dabbled in attempts to improve the gas apparatus used for the mechanical work of his profession, and his experiences in that line eventually caused him to go in for the construction of the apparatus on a commercial scale. This led him on to further steps until eventually his name became a household word with those who are concerned in the manufacture and placing of appliances for the use of gas for fuel in the apparatus of the laboratory, workshop or home. He was a prolific writer, and his book on "Coal Gas as a Fuel," has been widely read. He was an associate member of the Gas Institute, and when that body was merged with the newly formed Institution of Gas Engineers he was placed on its honorary membership list. At the time of his death he was head of the firm of Fletcher, Russell & Co., whose mammoth shops for the manufacture of gas appliances are located in Warrington.

Notes——

The arbitration Board appointed to assess the value of the franchise of the Atlanta (Ga.) Gas Light Company for State taxation purposes, have named $147,000 as an equitable figure. The State's valuation was $512,000.

Mr. L. Monfort, of Hammonton, has been elected President of the Hammonton and Egg Harbor City (N. J.) Gas Company, vice Mr. H. E. Woodman, resigned.

Gas plants are proposed for Juneau, Wis.; Wayne, Neb.; Palmer, Mass.; and Missouri Valley, Ia.

[Concluded from Page 527.]

ELEVENTH ANNUAL MEETING, PACIFIC COAST GAS ASSOCIATION.

Held in San Francisco, Cal., July 21-23, 1903.

Second Day—Afternoon Session.

Mr. R. P. Valentine, of Sacramento, Cal., as Editor of the

EXPERIENCE DEPARTMENT,

presented the following budget:

Mr. President and Fellow Members: The Experience Department has this year more than maintained its standing. In fact we may state, without the slightest compunction, that the record has been broken. Since the establishment of this department the number of contributions handed in by the members of the Association has decreased yearly, but you will all agree with us that, in the present report, the climax of paucity has been reached. It is our duty to inform you that fully 3 per cent. of the members of the Association have supplied experiences for this report.

Many of you will perhaps look upon this fact with some apprehension. The thought will strike you that interest is lagging and that the welfare of the Association and the success of our conventions do not claim the attention they should. The Editor is forced to admit that for a moment he, too, was led into this belief. The lack in numbers of the contributions and the apparent unwillingness of the members to supply material are serious and deplorable facts, and at first thought may be considered ominous signs of growing loss of interest, but this is assuredly not the case.

The cause of the meagerness of this report can be traced directly to the fact that the gas men of the Coast are, almost to a man, so pushed with business that they have not the time to devote to what they consider minor matters. Perhaps a few of those who felt disinclined to furnish experiences imagined that their contributions might prove old or "stale" to more experienced gas men, and thus meet with more or less derision, but we hope that this is merely surmise.

We have received a large number of letters from various members of the Association, all of which show that the gas men of to-day are leading strenuous lives and are undoubtedly having experiences galore, but the rush of business sweeps everything before it. One correspondent states that his greatest experience has been in endeavoring to find some way of getting his orders completed.

We have, first, a very interesting and instructive contribution from Mr. L. B. Miller, Advertising Manager of the Denver (Col.) Gas and Electric Company. This article pertains to the vital question of advertising, and upholds the necessity of persistent and striking advertisements. It is as follows: "Your favor of the 13th received, and in reply beg leave to say that I am at a loss to know in just what manner I could be of any service to you. Should I give you the amusing experiences an advertising man must go through in his different lines of work, or should I give only the side which shows up when your pet advertising scheme falls down and you are requested by the manager to be more careful, etc., etc., etc.?

"The worst that I have had to contend with was a problem of this sort: We don't need to advertise to sell gas at 25 cents per 1,000 for ranges aud heating. If you can tell us how to keep people from using natural gas for lighting at 25 cents per 1,000 and pay $1 per 1,000 for artificial gas we would like to do business with you. This problem is still unsolved. I am inclosing to you two series of advertising matter which have proven very effective, and I have found by experience that no matter where you place your advertisements they must be out of the ordinary, so as to attract attention and hold attention, and cause comment. This brings results. No matter what the line of business, it must be advertised, for as Gladstone said, 'Nothing except the mint can make money without advertising,' and in gas advertising there is a larger field than in any other line, for you have both the women and men to work on; both benefit by the use of it, During the past school term we found we could secure the aid of the high school pupils in advertising the gas range by offering cash prizes for the best essays. This can be worked for an indefinite time, for, on the awarding of the prizes, an evening's entertainment can be given for the reading of the prize essays. Then, having the entire town covered with copies of the prize essay, you will see from this that you have both the parents as well as the younger people interested in gas ranges. It is the education that counts.

"The solicitor of a gas company that is doing advertising finds, when he approaches a party in regard to installing a range, that she is not

altogether ignorant about the uses of the same, and that he is not compelled to put in several hours in convincing her that it is less expensive, cleaner and more helpful than the old-fashioned coal range; for where is the woman who does not read the advertisements? Advertising, while it does not at all times complete the sale, makes the sale possible; and, again, if you are going to advertise, don't do it because it's cheap, for you will invariably find 'cotton' goods instead of the 'all wool and a yard wide kind.' If you are going to send out advertising matter, dress it up in its best clothes. You wouldn't send a solicitor out in his overalls after business; now, would you? Trusting that this will be satisfactory to you, and wishing you all the pleasure and enjoyment possible at your convention, I am, very truly yours, L. B. MILLER."

We have here a little experience that will probably be of interest to the chemists of the Association. The writer says:

"I send you by mail a box of crystals that may interest the members of the Association. These crystals formed, during the winter of 1901 and 1902, on the inside of the covers of the purifying boxes, shortly after the covers were removed for changing.

"When the covers were removed drops of what appeared to be water covered the inside of the cover, and within an hour or two the drops crystallized and fell to the floor. The boxes are 16 feet by 18 feet, and about ½ bushel of the crystals formed on each cover. We soon concluded that the crystals were carbonate of ammonia, but why they formed in the boxes was not determined until we discovered a stoppage in the water supply of the scrubbers, proving that the gas was not sufficiently scrubbed. The crystals have not formed since we regulated the water suply."

Another of our correspondents brings up the subject of prepayment meters, and makes the following favorable report regarding their use:

"The more I use prepayment meters the more favorably I am impressed with them. I find that they not only secure customers, but invariably retain them. I have had a number of my customers who were very much dissatisfied with their bills from an ordinary meter, and I would surely have lost them if I had not prevailed upon them to try a prepayment meter. In some instances I find they use more gas than they did with an ordinary meter, and I never hear a complaint from them. This is not an advertisement for a meter company, but is reported from actual results."

In conclusion I will read a letter from Mr. E. C. Brown, Editor of the "Progressive Age," showing the interest and cordiality that that gentleman feels for our Association. The receipt of this letter is, in itself, a very pleasant experience. Mr. Brown says:

"In response to your recent favor would say that our experience in getting out a gas journal has been quite satisfactory, but of little interest to gas men. I think you or your President might call attention to the excellent work done by the Ohio Association this year, and in a fraternal spirit frame a few words in appreciation. We all are anxious to know what the experience of California has been with oil fuel and the use of these heavy fuel oils in gas making. You might write to Mr. L. B. Miller, who gets up the advertising for the Denver (Col.) Company for his experience in that direction. Some San Francisco and Seattle people will be able to relate experiences in gas wars. Southern California, no doubt, has peculiar atmospheric conditions—cool nights and hot days, mild winters, etc.—which demand certain provisions. In electricity, transmission line losses and accidents, and transformer practices and bases for prices are of interest. These are suggestions that occur to us this minute, and if they are of use, you are welcome. Would suggest that you take in gas companies beyond the limits of the Pacific Slope in securing information. Trusting the foregoing may be of interest to you, we are, very truly yours, E.C. BROWN."

On motion of Mr. Britton votes of thanks for their labors were tendered to Editors Colquhoun and Valentine. The President, in announcing this action complimented the Editors upon the success of their efforts and reappointed them to the respective duties of each office.

PERMANENT HEADQUARTERS.

Mr. Lowe—Mr. Britton has consistently, for a number of years, urged doing something towards procuring a permanent headquarters. This matter has been carefully considered by a few members. It means the expenditure of a great deal of money which the Association cannot hope to provide as an Association, but ways and means have been discussed for acquiring this most desirable end. It is useless to talk it over during the Association session, so I move the appointment of a committee to consider the matter and report at the next annual meeting. [Adopted.]

The President—I will appoint as such committee Messrs. John A. Britton, L. P. Lowe, J. B. Grimwood, E. C. Jones and George C. Holberton. It is Mr. Britton's pet scheme. No other man will do one-millionth part as much work as Mr. Britton in fixing up this matter.

The following

REPORT FROM THE COMMITTEE ON PRESIDENT'S ADDRESS

was read by the Secretary:

Mr. President and Gentlemen: Your committee appointed to consider the address of our President beg leave to report that we have carefully considered the address and generally recommend its acceptance and publication. We consider it a very able, thoughtful, carefully prepared and comprehensive address, and one well worth the earnest study and digest of not alone every member of this Association, but by the gas fraternity at large.

While concurring in the main with the thoughts and suggestions of our worthy President, we, however, feel that his views looking toward the broadening of the scope of the Association's work, by opening it to the electrical fraternity as well as to the gas, are such as we cannot recommend.

The electrical industry, its magnificent record, and its great benefit to mankind, need no praise nor comment at the hands of your committee, but it is felt that the interests of both industries, so far as Association work is concerned, can be best served by considering them singly, and certain it is that the history of the meetings of the Pacific Coast Gas Association shows an insufficiency of time, during our present short sessions, for more than a presentation of the papers offered on subjects tangent to the gas industry and the discussions thereon.

Respectfully submitted, L. P. LOWE, FRANK A. CRESSEY, J. W. THOMAS, } Committee.

The

REPORT OF THE COMMITTEE ON OBITUARY

was then presented by Mr. R. P. Valentine:

To the Members of the Pacific Coast Gas Association: It is your Committee's sad duty to report the departure from our midst of one of our youngest and most esteemed members, Mr. C. E. Burrows, Jr., of Walla Walla, Wash.

Mr. Burrows, Jr., was removed in his youth, at a time when he was about to assume the duties and responsibilities so long and successfully conducted by his honored father. While Mr. Burrows, Jr., was only elected a member of the Pacific Coast Gas Association at the ninth annual meeting, it was his intention to become a very active member, and we had anticipated much from him because of the excellent training he had received from his very able father. Mr. Burrows, Jr., was born in Salem, Ore., and attended the public schools of Salem and Portland, Ore., and Walla Walla, Wash. Besides his father, he leaves, to mourn his loss, a widow and one son, to all of whom the sympathies of the Pacific Coast Gas Association extend.

R. P. VALENTINE, JOHN S. KANEEN, J. B. GRIMWOOD, } Committee.

On motion of Mr. Britton the report was adopted by rising, silent vote.

ELECTION OF OFFICERS.

The Committee on Nomination of Officers presented the following report:

Gentlemen: Your Committee on the Nomination of Officers beg leave to present the following named gentlemen to fill the respective offices named:

For President.—W. A. Aldrich, Spokane, Wash.

For Vice-President.—L. P. Lowe, San Francisco, Cal.

Secretary and Treasurer.—J. B. Grimwood, San Francisco, Cal.

Directors.—John Martin, San Francisco, Cal.; H. C. Keyes, Sacramento, Cal.; C. H. Pennoyer, San Jose, Cal.; Geo. S. Colquhoun, Fresno, Cal.

Respectfully submitted, JNO. A. BRITTON, C. E. BURROWS, HENRY E. ADAMS, } Committee.

Mr. Lowe—No member of this Association can be unmindful of the great honor which is conferred upon him when he is asked to accept any office in the Association; but I do not wish to accept the Vice-Presidency at this time for several reasons. You are all well aware that those who are prominently identified with the proceedings of the Association are more or less consulted in the selection of the officers; and at the beginning of the session I was spoken to on the subject, together with several others, and we decided that there was only one man in the Association at this time who was available for the position of Vice-President (which in time means the Presidency), and that man was Mr. Martin. Mr. Martin was spoken to on the subject, and while he

naturally demurred, I felt that his objections had been overcome. His principal objection was, because of his being so closely identified with many gas companies in the State owned by the California Gas and Electric Corporation, the Association might be thought by some to be dominated by the Corporation. That objection certainly cannot stand for an instant. This Association can never be, nor can any other Association be, a corporation affair. When we meet here we meet as individuals, and not as the employees of any concern, and I believe you all feel that way. No other man in California to-day has done more to advance the interests of the gas industry than has Mr. Martin. He has not alone bettered the methods of manufacturing, distributing, selling and working up the gas business, but he has also helped many of you in the way of increased salaries. Mr. Martin is a very busy man and he has not given as much time to the Association as we all would have liked him to. We all know that he is a brainy man, and that there is no subject discussed in our sessions but that he can enter into it with the best of us. I want the members of this Association to make history again. I want you to go over the heads of your Nominating Committee. I want you not to accept the report, by passing me by, at least this year, and substituting Mr. Martin's name in my stead. There is also another reason. It has been my desire and wish for some time past to present to the Association portraits of each of the Past Presidents and also with those of its honorary members, but I have felt some hesitancy in so doing because my father is one of the honorary members. I had intended to do it, but I certainly will not if I have to put my own portrait in the list. I know you would like to have all these portraits. They will be uniformly framed and will in time be very valuable to the Association. Next year I will promise you them if you will let me off from the Vice-Presidency now and put Mr. Martin in my place, and if you see fit in the future to confer this honor on me, I will accept it with pleasure.

Mr. Martin—Were I dead and could sit and listen to an obituary notice, I would be pleased to be here now. (Laughter.) I am satisfied that the committee acted wisely in the selection of the gentlemen who are to represent the Association during the coming year. They are well aware of the responsibilities and duties which I have, and they know that I cannot do justice to the occasion. I appreciate the kind words which Mr. Lowe has said in my behalf. At the same time I know you are not to be bribed with a few photographs. I cannot do justice to the position, and do not care to occupy it.

Mr. Britton—I want to say that Mr. Martin was the unanimous choice of the committee when it first convened. No other man was considered in any way. Mr. Martin was approached by members of the committee, and declined, partly for reasons as stated by Mr. Lowe, and for the further reason that his many duties, involving all the time he has at his command for the coming year at any rate, do not put him in a position to give the Association the time the office would require, and so he begged to be excused. The only next man, with due respect to the other members of the Association, was Mr. Lowe. We all know what he has done for us in the past years. It is not necessary for me to enlarge upon that. He is the logical candidate for Vice-President. I am used to nominating governors of States, and when I nominate a man he is surely elected. (Laughter.) I do not want to have the precedent of the nomination of Governors of the State broken by any such action as that proposed by Mr. Lowe.

On motion of Mr. Ross the committee's report was adopted.

Responses.

Mr. Aldrich—To say that I appreciate the high honor conferred upon me by this Association very inadequately expresses my sentiments. I realize that the honor is accompanied by a great responsibility—a responsibility I accept in the knowledge that I will receive the support of the officers and members, especially of our indefatigable Secretary, Mr. Grimwood. As I will have another opportunity of addressing you this evening, and the business to be gone through is considerable, I conclude by tendering the expression of my sincere thanks.

Mr. Lowe—I also wish to express my sincere thanks. I promise that I will give your President my most earnest efforts and do everything in my power to advance the interests of the Association.

Votes of Thanks.

Mr. Burrows—You all know how we have been served by our President during the session; how impartially and carefully he has ruled over our meeting. I want to move an expression of our thanks for the manner in which he has conducted this session. [Carried.]

Mr. Britton—I think it is due to one of our absent members to say just a word of explanation. Of course you have all noticed the absence of Mr. E. C. Jones—the first meeting he has failed to attend. The reason is simply ill health brought about by a great amount of extra work during the past year. His condition, while not serious, was really serious to some extent, in that he felt and all his friends felt that he needed recreation. It happened that just at this time an opportunity was offered him for the companionship of one of his friends to go into the interior on a month's journey. He spoke feelingly to me, and was on the point of giving up his trip because of the loss he felt it would be to himself to be absent from this meeting. But I assured him that his health was more to him than the Association at this time, and with many regrets he left, desiring me to express to you his continued love for the Association and for the individual members of it, and to say to you that for the next 10 years he would work with renewed vigor in your behalf.

Mr. Lowe—We all know, or we ought to know, that the principal burden of the work in the Association falls upon the Secretary. Mr. Grimwood, as you know, has accomplished that task willingly and cheerfully for a number of years, and it was only the night before last that I realized how much work it really meant. I learned that it takes almost 2 months' time each year; that is, if the various times were put together they would amount to 2 months' hard work in office hours. We cannot afford to pay him any sum that is adequate. We are imposing on him year after year as we did on brother Britton. His work seems simple, but I assure you it is not, and if to any member of the Association is due a hearty vote of thanks, it is certainly due to him.

Mr. Britton—I think I ought to be the man to second that motion. I do not know of any more pleasurable years than those I spent as Secretary of this Association. But now that I have passed from it and can realize the relief from the work, I can with more feeling than you may imagine second that motion. [Unanimously carried.]

Mr. Grimwood—Gentlemen; I thank you for your kind expressions. I can only say that if my work is appreciated, as I am sure what little I have done has been, it ceases to be work and becomes a pleasure. I have taken a great deal of pleasure in performing the duties of my office. I thank you.

The President—There is another matter we must attend to, which, because it does not happen to be in this room, we were about to forget, and that is the Novelty Department under the management of Mr. Hollidge. He has made it, in this first year, one of the features of the Association. I take the liberty of appointing Mr. Hollidge to succeed himself as Superintendent of the Novelty Department, and I sincerely hope the Association will remember him by a vote of thanks for his efficient work.

Mr. Hollidge—I thank you very much for your expression of sympathy; but I sincerely hope you will confer that favor upon some other member, as I have much to look after and think that 5 years' of work is sufficient. There are a number of men who have not had the pleasure of filling the office.

On motion of Mr. Lowe a vote of thanks was tendered to Mr. Hollidge for his excellent work.

On motion of Mr. Martin a vote of thanks was extended to the Pacific Gas Improvement Company for the use of their rooms and for the many courtesies extended to the Association.

Adjournment.

The President—The time has come for both the pleasant and the unpleasant duty of surrendering this gavel to my successor. It is only those who have passed through this position who can understand how one feels as he is about to be released, not only from its duties but from its pleasures. I wish to thank those members who, by their strict attention, have been of value to the Association. Some are necessarily of more value than others, by reason of being perhaps more interested. I wish to express my sincere thanks to you all for your hearty support. I have endeavored to be your servant for the past year, and will now surrender the gavel to my worthy successor. Good luck to you.

President Aldrich was then escorted to the Chair, and the meeting was declared adjourned.

Messrs. A. C. Humphreys, H. L. Doherty, Irvin Butterworth and the Dellwik Process.

[At the request of Mr. A. C. Humphreys we publish this reply to a letter from Mr. Henry L. Doherty, written to Mr. Irvin Butterworth, all in reference to Mr. Butterworth's statement in regard to the Dellwik apparatus included in Mr. Butterworth's report of the "Progress Department," made at the last meeting of the Ohio Gas Light Association. Mr. Butterworth and Mr. Doherty consent to this publication. Mr. Doherty's letter in full precedes; herewith, Mr. Humphrey's reply.—Eds.]

Denver, Col., July 3d, 1903.

Mr. Butterworth: Your note of May 10th pinned to Mr. Humphrey's letter was misplaced, but I have since found the letter from Mr. Hum-

phreys, which you requested me to return to you. I note what Mr. Humphreys says, and am sorry to be compelled to disagree with such an eminent authority, but by inference Mr. Humphreys puts me in the light of claiming more for the Dellwik process than Dellwik himself claims.

I still maintain that the Dellwik process resulted in a fundamental discovery in gas making. Results obtained in the Dellwik process can be obtained in any sort of a shell, provided sufficient blast velocity through the fuel beds can be maintained, but if anybody ever demonstrated that more than 90 per cent. of the carbon could be taken away from the top of the fuel in the form of CO_2, I failed to see an announcement of such discovery previous to the announcement made regarding the Dellwik process.

I think the theory of the Dellwik process is this: That by high blast velocities the time contact between a given molecule of CO_2 and a given atom of carbon is too short to secure decomposition of the CO_2.

If this theory was announced prior to the work of Mr. Dellwik, I failed to see such theory put in print, and I would be glad to know where I can find it stated and who deserves the credit for the evolution of this theory. I hold that it is not true that Mr. Glasgow pointed this out "very completely" in his paper read before the American Association. Mr. Glasgow simply observed that the production of CO_2 was increased by a high blast pressure, but he did not demonstrate or claim that practically all of the carbon could be taken out with a high blast in the form of CO_2, neither did he evolve the theory stated above which is very useful not only to gas engineers but to all fuel engineers.

If there is a standard water gas machine in this country that will permit the securement of results such as have been secured in the apparatus built by Dellwik, and with the necessity for no greater radiation loss or the necessity for no greater application of power, I will admit that there is some just cause for complaint in Mr. Humphreys' letter.

If there is nothing new in the Dellwik process, my position in this matter puts me in a class which evidently makes Mr. Humphreys very weary. I am perfectly willing to retract my statement if Mr. Humphreys can prove to me I am wrong, but I think the responsibility rests on him to prove that there is nothing in the Dellwik process, for the Dellwik process certainly has secured results that have never been secured prior to the time the results of the Dellwik process were announced.

If the theory of the Dellwik process is something old, Mr. Humphreys can undoubtedly tell me where the concise statement of this theory can be found.

HENRY L. DOHERTY.

Irvin Butterworth, Esq., President, The Denver Gas and Electric Co., Denver, Col.: Dear Mr. Butterworth: Your letter of the 7th of July replying to my letter, wherein I criticized that part of your official "Progress Report" to the Ohio Gas Light Association, in which you indorsed the claims of novelty and discovery made on behalf of the Dellwik process, has been forwarded to me here.

I really did not know what "promident American Gas Engineer" you were quoting; but one thing I was convinced of; viz.: That he was not informed as to the evolution of water gas, and what is technically known as the "state of the art." The memorandum from this gentleman, which you inclose in your letter, confirms me in the opinion I first formed as to his knowledge of the subject. If I remember correctly he was not directly interested in water gas until after many steps in its evolution had been taken. It is, therefore, not surprising that accepted features in efficient water gas practice, evolved through years of commercial operation, should have missed his attention until he was attracted by Mr. Dellwik's claim for novelty.

As I understand it, your indorsement of the Dellwik claims is practically based upon the opinions of this "prominent American Gas Engineer." I will, therefore, now consider in some detail his memorandum which you have kindly forwarded to me. I shall hereafter refer to your correspondent's communication as "the memo."

The first thing which strikes me is that your correspondent does not offer in answer to my request any evidence in support of his contention, but is apparently satisfied to reassert his opinions and to support his claims solely by asking me to disprove them. I quote from the memo:

"I still maintain that the Dellwik process resulted in a fundamental discovery in gas making. Results obtained in the Dellwik process can be obtained in any sort of a shell, provided sufficient blast velocity through the fuel beds can be maintained, but if anyone ever demonstrated that more than 90 per cent. of the carbon could be taken away from the top of the fuel in the form of CO_2, I failed to see an announcement of such a discovery previous to the announcement made regarding the Dellwik process."

This is not very clear nor very convincing. Few well known features of manufacture in the several industries have ever been specifically announced; and possibly in the case of some that have been announced most of us have failed to see the announcement. It is safe to say that in a majority of the patent cases which reach the courts no such specific announcement defining the state of the art is available as evidence. In many cases the written record of the state of the art is then made up for the first time.

But though no sensational "announcements" may have been made of its progressive steps, the routine record of those responsible for water gas evolution will abundantly show that their practical progress was throughout directed by an intimate knowledge of the theory of deep fuel combustion, now claimed as a "fundamental discovery" of Mr. Dellwik. For instance, I quote from the earliest record to which I have access at the moment, being Mr. Glasgow's letter to the engineer in charge of the *first plant* constructed by our London office:

April 4th, 1893.

"Are we not producing more CO in the generator than we are able to burn advantageously in the carburetter and superheater? This must be the case or we could not have so high a fuel consumption. The *remedy is, of course, to blast harder and quicker*. That means we must speed up the blower."

May 13th, 1893.

"We should run with the full depth of the fuel bed, but with a very hard, short blast, in this way reducing the energy sent forward into the fixing chambers, but at the same time retaining the full duty of the fuel bed for the conversion of steam."

Progress is made through evolution; "fundamental discoveries" are very rare. I think your correspondent would find it difficult to prepare a considerable list of "fundamental discoveries" in the gas business, if he went back to the time of Murdoch. Even Lowe's invention was not a "fundamental discovery," but simply the combination of well-known principles which had been practiced separately.

Long before the time when water gas was commercially produced, the control of the quantity of CO_2 was well known to be dependent upon the velocity of the air through the fuel bed. This point is at the very foundation of carburetted water gas development, but your correspondent, like some others, apparently fails to appreciate that the carburetted water gas engineer was restrained from going to the limit in minimizing the percentage of CO_2 in the generator blast gases by reason of his process requiring the production of CO for the economical, simultaneous gasification of the enriching oil. By trial and error it was learned that much less CO was required for the heating of the fixing chambers than was first allotted to that purpose, so gradually the pressure of blast was increased and the length of blow diminished until a balance was reached for the particular quality of gas desired.

If your correspondent will read Mr. Glasgow's paper, read in 1893 before the Incorporated Institution of Gas Engineers (see *Journal of Gas Lighting*, Vol. LXXVI., page 282), he will find that Glasgow there explained that, by modifying the pressure and length of the blast with relation to the depth of fuel, the relative proportion of carbon burned in the generator to CO and CO_2 could be modified at will. This was referred to as a "modification," because the process he was explaining required a certain amount of CO to be burned in the fixing chambers; but surely a knowledge of generating conditions which permitted of the exact balance between CO produced (in the blast gases) and CO required for the gasification of the oil, whatever the quality of the gas, leaves no room for the term "fundamental discovery" as applied to Mr. Dellwik's crude patent claims for simple blue gas manufacture.

The veteran gas chemist, Mr. Wm. Young, inventor of the Peebles oil gas process, with which the Dellwik "process" has been somewhat identified, in a paper read before the recent meeting of the North British Association of Gas Managers (see *Gas World*, August 1st, 1903), frankly acknowledges that Dellwik cannot claim the discovery of this principle to which your correspondent refers. Mr. Young says:

"After drawing attention to the principles involved in the production of water gas by the Dellwik and Lowe processes, and showing that the principle of utilizing the largest possible heat energy of the carbon of the coke, by burning it to carbon dioxide during the blow period, had been first used in the Dellwik process, I showed that the principle was not new, but that it was well-known and had been for a long time recognized and applied in the working of the Lowe process by Messrs. Humphreys & Glasgow."

Mr. Glasgow certainly does not claim to have evolved what your correspondent calls the "theory of the Dellwik process," viz.: (quoting from the memo).

"That by high blast velocities the time of contact between a given molecule of CO_2 and a given atom of carbon is too short to secure decomposition of the CO_2."

On the contrary I can say that this "theory" was common knowledge long before Glasgow began to study the chemistry of gas making. In his paper of 1890, Glasgow simply emphasized the necessity of putting this knowlenge into practice, if good generating results were desired. I instanced this paper when first writing to you because it begins with the concise and matter of fact expression of the principles, then fully understood by those skilled in the art—principles which govern all economical water gas practice, whether Lowe or Dellwik.

Your correspondent implies that Mr. Dellwik's "fundamental discovery" was that "more than 90 per cent. of the carbon could be taken away from the top of the fuel in the form of CO_2," but the Dellwik patent claim is the operation of a water gas generator so that "the blast products contain *more* CO_2 *than* CO." That means so that 40 per cent. of the blast carbon be "taken away from the top of the fuel in the form of CO_2."

But these percentages, however differing, are not material, for it is, of course, easily possible to take away any desired proportion of the blast carbon in the form of CO_2, provided the length and strength of the blast, and temperature and depth of fuel bed be adjusted to that end. The economy of such adjustment, however, is influenced by the percentage of CO_2 permissible in the water gas and the make obtainable from the plant, and in the case of carburetted water gas by the fact that the blast products must contain the necessary energy for gasifying the enriching oil.

In my connection with the development of water gas manufacture I have seen the standard Lowe generating conditions changed from a blast period of 30 minutes to a blast period of 2 minutes (for say 16-candle gas) with corresponding decrease in blast OO; yet no valid claim of "fundamental discovery" or patent rights could possibly attach to such a practical evolution under well-known guiding principles. Consequently no generally advertised "announcement" has been made of the numerous progressive steps in this evolution, any more than of the changes from a pressure little above that of the atmosphere to, say, 300 pounds per square inch, in the case of steam engineering.

Likewise, when Mr. Dellwik adopts the Lowe generator conditions, *without the fixing chambers*, and is obliged to shorten his blast period correspondingly for "blue" gas, his work is not fairly described as the "greatest discovery since the Lowe process." It was merely a limitation of well known practices to a single purpose.

I quote again from your correspondent's memo:

"If there is a standard water gas machine in this country that will permit the securement of results such as have been secured in the apparatus built by Dellwik, and with the necessity for no greater radiation loss or the necessity for no greater applicatiou of power, I will admit that there is some just cause for complaint in Mr. Humphreys' letter."

And in his third paragraph, which I have already quoted, he says:

"Results obtained in the Dellwik process can be obtained in any sort of a shell, provided sufficient blast velocity through the fuel beds can be maintained. * * *."

The above quotations again evidence that your correspondent has failed to grasp the subject, and consequently begs the whole question in his conclusion. In the ordinary working of the Lowe process, the fixing chambers necessarily present resistance to the blast and involve radiation, but they also perform highly important manufacturing functions over and beyond the production of "blue" gas.

When the *only* product required is blue water gas the conditions become very simple. The fixing chambers being abandoned, the mere elimination of their back pressure (without other change) more than doubles the generator blast head. The corresponding and necessary reduction in the length of the blast (both for economical reasons and to prevent the plant being burned out) gives us the so-called Dellwik process—*i. e.*, ordinary carburetted water gas practice, simplified for and restricted to the exclusive manufacture of blue water gas. But responsible water gas engineers must cover a broader field than that. Blue water gas manufacture forms but the foundation of our work.

I hope I may claim some knowledge of the situation, but I am unable to discover in blue water gas manufacture any general economic value to a company engaged in the distribution of town gas, and I consequently see no room on a gas works for apparatus that can produce only blue gas.

Speaking for my own firm, I may say that the only water gas plant we will recommend to others or utilize in our own practice as gas distributers must be capable, by adjustment of back pressure but without structural change, of making carburetted water gas of any practical quality, or blue water gas if desired, with an efficiency at least unexcelled by any known blue gas generator.

I again quote from your correspondent's memo.:

"I am perfectly willing to retract my statement if Mr. Humphreys can prove I am wrong, but I think the responsibility rests on him to prove that there is nothing in the Dellwik process, for the Dellwik process certainly has secured results that have never been secured prior to the time the results of the Dellwik process were announced."

As I cannot admit your correspondent's conclusions, neither can I admit that the burden of proof rests on me. Your correspondent, occupying a position of importance and influence in the gas industry, has assumed the responsibility of asserting that the so-called Dellwik process contains a "fundamental discovery." This in the face of the statements of engineers of repute, who have practically devoted their lives to this subject, to the effect that they had understood and practised the principles claimed as the Dellwik "discovery" for years before they ever heard of Dellwik. No; the proof rests upon your correspondent and your good self; if this letter does not satisfy you. But as to results.

The drawing of a comparison between blue gas and carburetted water gas by deducting the volume of the oil gas contained in the carburetted water gas mixture, without making allowances for the CO burned to CO_2 in the fixing chambers in the useful work of producing this oil gas is, of course, ridiculous. Nevertheless this is the method persisted in by Mr. Dellwik and his associates. Indeed we have even seen this method extended to the comparing of the consumption of "carbon" during special brief tests of the Dellwik generator with the consumption of gross coke (including moisture) increased by one-third, to *compensate* for oil gas volume, over extended periods of intermittent working of a Lowe carburetted water gas generator. But it will do no harm to see where such a method of comparison brings us, *provided its fallacy is kept fully in mind.*

In the publications, elsewhere referred to, advocating Dellwik blue water gas at Ilford (and greatly understating its cost) the consumption of generator fuel for six months was given as 36 pounds per 1,000 cubic feet.

The returns of the Brighton Gas Company from carburetted water gas plant constructed in 1895 averaged, for the three years 1896, 1897 and 1898, 27.6 pounds generator fuel per 1,000 cubic feet of carburetted water gas. This carburetted water gas averaged probably 22 to 25 per cent. oil gas. Consequently if the whole of the generator fuel were charged against the (say) 77 per cent. of blue water gas, the fuel consumption would be 36 pounds per 1,000 cubic feet of blue gas produced; exactly the Ilford figure, although no credit is taken for the useful work of gasifying the enriching oil nor for the waste inseparable from that additional and important manufacturing operation.

It seems evident, therefore, that apparatus had been installed, *prior to the introduction of the Dellwik generator*, having a fuel economy unequalled by Dellwik plant of present construction, while modern form Lowe plant can be found regularly working with less than 30 pounds gross generator coke, where the volume of oil gas does not exceed 15 to 18 per cent. of the finished gas.

To reverse the comparison, you can see what results the Dellwik generator yields in the production of illuminating gas, in combination with some enriching process, from the brief analysis of the Cleethorpes' results, as given in Mr. Glasgow's article, "Blue Water Gas at Ilford, and Elsewhere," *Journal of Gas Lighting*, April 14th, 1903. This particular reference appears in Section III. of the article. Here the Dellwik generator is backed up by as good a system of oil retorting as can be found—the "Peebles" process of Mr. Wm. Young. An analysis of the figures given by the Dellwik-Peebles advocates shows that 32½ pounds of coke were required for the generator alone, in the manufacture of blue gas, *per* 1,000 *cubic feet of the mixed carburetted water gas.* The Humphreys-Glasgow apparatus in regular working in many works will average better than this, and its fuel expenditure covers the converting of the oil into gas, which, in the Cleethorpes' instance, required an additional 13½ pounds per 1,000 cubic feet of 18-candle gas.

I would finally recommend your correspondent, if he really wishes to understand this question in all its bearings (as I believe he does), to study (not simply read) the articles, correspondence, papers, discussions

of papers, and editorial comments which have lately appeared in the *Journal of Gas Lighting*, beginning with an article by one of the *Journal's* Editors, which appeared in the issue of December 30th, 1902, and continued to the last issue.

Mr. Glasgow therein has easily disposed of the unjustified and unjustifiable Dellwik claims, and if your correspondent will study all that appears on both sides of this controversy I have but little doubt that he will be ready to acknowledge that, in indorsing the Dellwik "process," he has done what we all have done in our busy lives, spoken too hastily.

After all it comes back to the question, did we, who were really skilled in water gas manufacture, understand this relationship between blast pressure and proportions of CO and CO_2 in the blast products before Dellwik attempted to claim as his "discovery" the results of many years of labor of a number of earnest workers?

There can be but one answer, from whatever standpoint the view.

Sincerely yours, ALEX. C. HUMPHREYS.

The Outlook for the College Man.[1]

Never before in the history of the world has it been so easy for the ambitious youth to obtain a college degree. The public schools provide all the preliminary training required for admission, and this without expense to the scholar. Once having passed his entrance examinations the road is assured, provided he has the necessary grit and self reliance, and is free from the germ of laziness. In these days the man working his way through college is respected by faculty and student corps; he pays his way by the sweat of his own brow, and his independence is admired even by those who do not have to follow a like course. He chooses his profession, plods along, receives his degree, and enters the world to fight his battle and either to succeed, fail, or stand still as a nonentity. Now the question is this: Does the college graduate have a better chance than the man who never saw such an institution? From a strictly utilitarian point of view is the equipment he has acquired worth the candle, and will it enable him to reach his goal more quickly?

Inferentially, this might be answered affirmatively by mere reference to the fact that colleges are springing up all over the land, and yet the patronage these new institutions receive has no effect upon the older ones. From this it is certain that the demand exists for the so-called "higher education." Vast sums are necessary to keep all the colleges running, but endowments are frequent and liberal, so that we rarely hear of a college being compelled to close its doors because of lack of funds. In this way the demand is met. Those who give for this purpose certainly believe in the advantages of an education.

There is another and far stronger argument in favor of a college course. All of our great corporations and manufacturing concerns seek the college man, but in no sense do they seek him because of his familiarity with their business or with any detail of their transactions; neither do they want him for the smattering of knowledge he may be able to devote to their interests. They take him solely for the training he has gone through, and not for the wisdom that may be stitched in the lining of his cap. That training the man of affairs can further develop along lines which will be useful to him. The "having learned how to learn" is of vastly more importance in actual operations than all the learning absorbed in any course of four years.

Considering the aggregate the demand appears to be about equally divided between the classical and the technical graduate. Concerns engaged wholly in manufacturing prefer a man who has been trained along lines fitting their own processes, but there are others of equal importance and magnitude who find room for a classical training. The Pennsylvania Railroad Company, with the vast diversity of their transactions, can always find a niche in which to place a college man, no matter what course he may have pursued. If he shows ability in any direction whatever, there is an opening, and it is never the case of a round plug in a square hole. The General Electric Company now have at their works nearly 150 young men who graduated from technical schools last June. These men are really serving a probationary period to test their qualifications and their practicability as builders or handlers of electric apparatus. They are passing through a preparatory course, or advanced system of apprenticeship, to find what branch of the business they are best qualified for. In all cases of this kind the rapidity of advancement depends entirely upon the industry and ability of the worker. All companies are willing, and in fact eager, to push a man forward just as quickly as he can go, but, on the contrary, they have no use for a man who promptly settles down to one job and evinces no ambition. There is no philanthropy in this; it is a clear cut business proposition by the company to obtain the best help possible. A man who masters one task is expected to kick, and it is hoped that he will kick, for something else in order that he may learn more.

Some years ago the graduate was not paid enough to enable him to live comfortably. To meet his necessary expenses he had to have outside resources. He was treated as a regular apprentice and was paid a boy's wages. Managers found that this policy worked to their disadvantage by depriving them in many cases of the services of bright men who could not depend upon outside assistance. This has been changed, and the college apprentice is now paid wages sufficient to permit him to live decently by his own exertions. The manager displayed no charity by this action. He saw how his business was handicapped by the old method and changed it for his own benefit only. Incidentally he helped the graduate, but the idea of assisting the graduate did not influence him in the least to alter his plans. It gave him the best talent the college world had to offer, and presented an equal opportunity to rich and poor.

Records prove that in producing establishments the college man at 30 is far in advance of the man of the same age who entered by the apprentice door. The graduate may have been 25 before he donned a jumper, but in 5 years he learned more with the college training he had as a foundation than the regular journeyman in 15 years of actual work in the shop. His reward is apparent in the greater responsibility of the position he occupies and in the greater wages he receives. Even at 30 it is shown that the 4 years spent at college were not wasted, and that he really acquired the ability to learn how to do things.

1. *Iron Age.*

The Attitude of Trades Unions Toward Trade Schools.

[By MR. WILLIAM H. SAYWARD, Secretary National Association of Builders.]

The brief paper I am to present for your consideration relates to the attitude of trades unions toward trade schools, rather than to trade schools and workingmen's organizations, as the subject is announced. There are many organizations of working men whose purposes do not lead them into any relation whatsoever with trade schools, and I have, therefore, concluded that the contribution desired from me is, first, a statement of fact as to the attitude toward trade schools of those organizations of workmen which distinctly represent the trades affected by the operation of such schools, and, second, such reflections as may be suggested by these facts.

Trades unions, as a rule, are opposed to the trade school idea; and a summing up of their reasons for this attitude may be expressed as fear of the creation of too large a supply of workmen through the operation of such schools. Many other reasons, more or less superficial, are given, but the real underlying objection is that unrestricted training in the trades will flood the market, which, it is claimed, is already overcrowded. While this, as a general statement of the expressed attitude of trades unions, may be wholly correct, it is likely to be misleading, unless qualified by a statement of certain conditions which examination of the field will show.

In the older communities, notably Austria, Belgium, Germany, Switzerland and France, and even in Great Britain, the attitude of trades unions has been materially modified within recent years, and a tendency is manifested to encourage the trade school, where its operation is restricted to training only those who have taken up some trade as a positive vocation. In these countries, as well as in some other parts of Europe, the continuation school, or schools, for extending the knowledge of the actual workmen and apprentice into the theory and technique of his trade, are not only looked upon with favor by trades unions, but are often established and maintained by them, and, in some cases, even by workingmen's clubs and friendly societies of workingmen, whose membership is general rather than specific.

While, therefore, speaking in a broad sense, trades unions do not look with favor upon the trade school *per se*, one cannot fail to notice evidences of great and increasing interest among workmen at large, as well as in their organizations, in that application of the trade school idea, which gives opportunity for development in their chosen trade to those who have thrown in their lot with the actual workers and propose to earn a living in their company. I am inclined to believe that a very appreciable portion of the aversion which trade unionists have manifested toward the trade school is traceable to the unexpressed, but still positively existing, feeling that people who are not willing to be of the working classes seek to gain, through the trade school opportunity, enough knowledge of the trades to enable them to practice them if they choose, and thus encroach upon the preserves of those who must

earn their living by the trades. This is probably not a well founded or sensible conclusion; but that the idea has lodgment indicates one of the points which, connected with others, creates grounds for opposition in the minds that, perhaps, are by nature, and perhaps through the persistent iteration of the trade union idea have become, essentially jealous. The fact that the wide open trade schools are doubted, while continuation or improvement schools for actual workmen and apprentices are received with increasing favor, would seem to give color to my belief on this point.

Next to the fundamental objection which I have cited, the most clearly expressed opposition to unrestricted trade school training is that it has a tendency to produce partially trained mechanics, who go out into the community, proffer themselves and are received and employed as full fledged workmen; thus becoming not only competitors of the "underpaid and generally handicapped mechanic," as the unions almost universally claim them to be, but undesirable also for those who employ them, inasmuch as they cannot deliver the skilled service which they profess to be able to deliver. Associated with this second expressed objection is the claim that the attempt to teach trades in their entirety, in a school, is futile; that, therefore, schools which endeavor to do so are of little, if any, real value as far as furnishing mechanics fitted to undertake practical work is concerned.

Another reason given why trade schools are not a benefit is that "employers no longer desire the thoroughly trained all round man, but want only the specialist;" therefore, a trade school, which can at best teach a young man to perform the general operations or manipulations of a trade only fairly well, is of little real value to him, for he is not fitted to compete with the specialist in any department of that trade. In some of the minor trades, such as cigar making, the objection to trade schools is most strenuous, on the ground that the training in such schools has a tendency to increase child labor.

Then there is always the jealousy, which I think trades unions unconsciously foster, which expresses itself in the belief that trade and technical schools are designed to help the rich and not the poor; to provide opportunity for young men of means who intend to go into manufacturing, or to conduct some business, to secure a technical training in and command of the elemental movements of a trade, rather than to help young men who intend to become real workmen. Many other specific "grievances," to use a common trade union idiom, could be stated, but they are all closely related to the main causes of objection which I have cited.

It is to be noted that all of these attitudes of objection are, at the present moment, more pronounced in the United States than in older countries. Whether this difference in older countries results from an evolution within the organizations themselves, which has directly produced a modification of application in trade school instruction, and so diminished the opposition, or whether the Government in these countries, without any pressure or influence from trades unions, has created a different and more restricted form, I am unable to determine; but, for our present purpose, it is, perhaps, enough to know that a general difference in operation prevails in the older countries and that there seems to be less opposition to this method of trade instruction than to the methods in vogue here.

Consideration of trade school conditions as existing in the United States, and as existing in Great Britain, in France, Belgium, Germany and Switzerland, will be helpful in demonstrating where diminishment of friction begins. In this country we have comparatively few trade schools, and the best of those have been established by private individuals, who, awakened to a great need, preferred to devote themselves and a portion of their means to meet this need, rather than to await the slow process of public recognition, and then the still slower process of public action.

It is necessary here to call attention to the fact that this discussion does not relate to the technical or manual training school in any respect, but to the trade school proper, the school which purposes so to teach a trade that the student will be fitted to industrially use the trade. The instruction in such schools is made available, to a large extent, in the evening, so that young men at work during the day may take advantage of this opportunity. Thsre are many schools of combined academic and practical character known as manual training and technical schools in this country, both private and public, and to these there is no expressed objection by trades unions, but there are few trade schools pure and simple, and to these, unions, as a rule, are at present strenuously opposed. The idea and purpose in these schools are to turn out finished mechanics, as far as knowledge of the science and practice of the trades is concerned, it being usually frankly admitted that the graduates will not be commercially equal to skilled workmen in point of speed of execution or adaptability, until they have had sufficient experience with real work to give them these qualities. In practice, however, it turns out that the graduates of these schools have attained fully enough science and just enough practice to fix methods and principles sufficiently to enable them to pass current as skilled workmen, particularly when there is great demand; and they, therefore, seek and obtain the going rate of wages as readily as men who have worked for years at the trade. In these schools of ours there is no attempt, I believe, to restrict the opportunity to those who have chosen a special trade as their vocation, nor to make them distinctly continuation schools, or schools for developing in theory as well as technique, those already entered as apprentices and thus devoted to the trade. These purely trade schools are privately established and managed, and there is no Governmental supervision, either municipal or general. There are, at present, practically no trade schools, either wholly or partially, supported by the public in any part of the United States.

In foreign countries a distinctly different condition prevails. Generally speaking, trade or industrial schools are either wholly established or partially supported by the Government or by municipal authorities, or are conducted under the most careful supervision by the authorities, either of State or municipality. This condition is particularly noticeable in Germany, which, of all the European countries, has given the greatest impetus to practical trade education. While in Germany, as well as in many other foreign countries, the founders of trade schools have often been the *communes*, guilds or industrial associations, the community at large, either through State or municipal action, now participates very generally in the support of the schools. A large proportion of such institutions are entirely at the expense and under control of the State, while all schools of this character are more or less under supervision by the authorities.

The industrial school system in foreign countries, whether of semi-private or of public character, seems to be founded on the presumption that the young man has determined pretty definitely the career into which he expects to enter, and will shape his education accordingly. Therefore, the trade school addresses itself to those who have either already begun as apprentices or are about to do so, or to workmen who desire to make themselves more proficient in one grade or another. It is this generally prevailing attitude in Europe which has disarmed the trades unions of their opposition and presents the distinction to which I wish to draw attention.

The demonstration is narrowed down to this: That when trade schools limit themselves to improving the theoretical, technical and practical knowledge and skill of those who are already entered upon a trade, the trades unions seem to approve and, in many cases, to participate in conducting them. Here, then, seems to be very clearly marked the point at which friction begins to diminish. The next step should be to determine whether this point is well taken by the unions and, therefore, whether they should be supported in it. It will be readily admitted that any schools for the higher vocations or professions which pretend to turn out at graduation the completely qualified practitioner assume too much, and whether there be any organized opposition to this assumption or any concerted disclaimer set up or not, it still remains true that the graduate is not so received, and he is practically compelled to pass through quite an extended season of severe experience before he is accepted at full value, "going rate of wages," by the community in which he attempts to practice. It apparently needs no union to produce this effect.

When, however, we consider the mechanical planes of occupation, commonly classed as laborious, we find that the public does not set up, either instinctively or with definite purpose, any such test, and, therefore, organizations in these vocations have addressed themselves to the protection of their class from indiscriminate competition. These organizations have very good ground for their assertion that trade schools tend to demoralize the trades when managed on the "wide open plan"—that is, free to anyone who wishes to attend, regardless of whether he is committed to a trade or not, and with no control or supervision set up, within or without, to prevent him from departing from the school, either at the close of the course or at any time, and with a smattering of skill and knowledge pass himself off as a full fledged practitioner. This possibility, which, as I have already indicated, has in practice developed into a probability, is certainly not to be looked upon with complacency, even by the intelligent, though unaffected, observer; therefore, it is not to be wondered at that those most affected should demur, and somewhat strenuously criticize the source from which the possibility springs.

They may well claim that if the learned professions, such as the medical and legal, and sometimes others, are safeguarded with the greatest care in the skilled trades there should be some method of control which

will, at least, guarantee that insufficiently trained workmen shall not be given full standing and full wages, simply because they have passed through, or perhaps only partially through, the courses of a school. But, while this attitude is natural and wholly defensible when viewed from the standpoint of reason and of experience, it is not at all reasonable or wise to condemn the trade school itself. For I think it can be conclusively shown that upon schools of this character the trades, as such, must depend for their own preservation. Therefore, the effort should be not to destroy the trade school or blindly oppose it, but to modify its methods and utilize it as the only available means to regulate and control the output of workmen—which is really the point at issue, as far as trades unions are concerned—and to protect the community as well against the untrained and inexperienced; for, under existing conditions, for some of which the trades unions are to a considerable extent responsible, the public is in some danger of losing altogether the all-round artisan—the mechanic skilled and interested in his calling.

I have said that the preservation of the trades themselves depends upon the proper development of the trade school idea. This is evident for two reasons: One, the passing of the old method of apprenticeship, and the other, specialization in the trades. There is no probability that the old method will be re-established. Strenuous efforts, it is true, are being made in Germany to preserve the apprenticeship system in those trades for which it is adapted, much legistation having been enacted in this direction in recent years. But, while it is possible under a government as paternal and positive as that of Germany to reinstate the old guilds with all their power and influence, it is hardly conceivable that, under freer forms of control, employers can be commanded in such matters to the extent that they apparently are in some of the European monarchies, Germany in particular.

Specialization has sought out almost all the trades, even those connected with building, where it has seemed least likely to get a foothold. That these two movements, which may both be classed as commercial movements, threaten the trades, as trades, is beyond question, and, under the commercial demand it seems to be inevitable that the trades will be split up endlessly, so that no one workman will eventually be capable of doing more than a fragmentary portion of a trade. The trade school furnishes the one measure of protection by and through which these separate portions may be kept in one consistent whole, and the relation of the parts so taught and the capacity to combine the parts be so developed that all-round men, capable of understanding and executing a whole trade, will not entirely pass out of existence.

It behooves the trades unions, as custodians of the interests of the workmen in the trades, to look more deeply into the function of the trade school, and to consider more carefully how much the interests they have in charge depend upon the existence and operation of these schools; and it behooves employers to concern themselves more effectively, to the end that they may reap the benefit which will surely come through wise administration of the trade schools.

It is evident that there are some weaknesses in trade schools as at present developed. I am inclined to think that one of these is indicated in the somewhat crude objections made by trades unions. I am convinced that there should be a comprehensive and effective system established, utilizing the trade school idea, which shall supplant completely the present unsatisfactory condition of floating off on the market an unfinished product, which, if it ever becomes finished, becomes so in spite of conditions, rather than by virtue of or purpose in them. I do not believe for a moment that our privately established trade schools were ever intended, or expected, by their founders to produce too large a supply of mechanics and thus flood the market, or to incite young men to half perfect themselves and then deceive the public; but the function and purpose of the schools were distinctly expressed and intended to be to furnish as systematic and favorable a method of instruction and training as possible to fill a void created by the decay of an old system which, while sufficient in its day and generation, had vanished never to return.

This function and purpose, to my mind, are more emphatically evidenced year by year, and as this instruction and training can best proceed in conjunction with practice in real work, in which employer and workmen are engaged, I believe that the most complete method of operating that function and realizing that purpose lies, as I conceive it does in all matters affecting labor, in a more complete co-operation between organizations of employers and organizations of workmen. The policy of this co-operation should be to create good workmen, the best, the most skillful, the most complete, and then to have the unions composed of these, and these only. By a policy of this nature, which could only be carried out by a joining of hands of employers and workmen in the management and direction of trade schools with this end in view, the unions would be relieved of the most telling criticism now used against them, and their reason for being would be more firmly established. By this measure the unions would be strengthened by "recognition" in the best sense, inasmuch as they would become the gauge and standard of excellence, and, instead of coercion being necessary as now, to keep the organizations up to that efficiency which numbers are felt to indicate, membership would be eagerly sought, because desired as a sign of selection, and as a safeguard against being herded together, as now, in one mass of good, bad and indifferent. The "non-union" man would then be the inefficient, the unreliable, the dishonest, the quarrelsome, the disturber, the dissolute and the generally unworthy, and non-union he would have to remain until he should so reform as to make himself desirable. Then would there be the true line of demarcation between union and non-union, a natural and proper one—not the artificial and dangerous one, which now exists.

Unions would then be accepted by all as a clearing house for workmen, as a sure source of supply of trustworthy, efficient and skilled workmen, and not, as now, an aggregation of anything and everything that will simply swell an army, the leaders of which assert that "labor is a force militant," and that "as such its victories are to be achieved" Until this dispensation labor has been supposed to be of the essence of peace and not war, and it has not been until the forces of labor, as demonstrated through cheaply conceived, unrestrained or poorly administered organizations, have been diverted from their true channel, that the world has witnessed the commission of acts under the impulse of this force, which have been unworthy of humanity, and which have roused the self-respecting in all our communities to most determined resistance.

It is my belief that the trade school, properly utilized as suggested, supplemented by further intelligent co-operation of real employers and real workmen, in all affairs of mutual concern, may be, in this field and in this state of danger, one of the greatest of conservators of safety. But these agencies for good must not be left to dilletante exploitation nor to the equal danger of too general usage. Let employers and workmen engage in this service with the glad seriousness of conviction, and hope will succeed despair in all these relations.

In conclusion, I would state that in my opinion the trade school does not offer a privilege which anyone should be permitted to enjoy without judicious supervision and control. It is an opportunity which should be chiefly available for those who determine upon a trade as their life work, and who have a reasonable degree of fitness for it. In other words, the trade school should be considered a training field for actual workers, and its operation should be reasonably restricted and controlled, to the end that its graduates may have definite standing and the community, as a whole, be protected against partly perfected workmen.

Liquid Fuel.

At the last meeting of the British Association a most interesting paper on this subject was read by Mr. A. M. Bell. For the summary of it given here, together with an abstract of the discussion that ensued, we are indebted to *Engineering:*

The paper gave many details and particulars of various oil fields, more especially those of Russia, the latter being illustrated by a number of lantern slides, prepared from photographs taken by the author. The author also gave particulars of a large number of burners and other apparatus employed in the combustion of liquid fuel. Many of those we have already described and illustrated in these pages, and it will, therefore, be unnecessary to refer to them again in this connection. The paper, however, which was of considerable length, gave a useful general *résumé* of what has been done in regard to the adoption of liquid fuel. The author stated that the recent development of Texan oil fields has resulted in an enormous increase in the number of steamers, locomotives and factories using oil fuel in the United States, whilst in South America Peruvian oil has been adopted in the neighborhood of the oil wells to a considerable extent. With the progress of oil fuel in Russia our readers are fairly well acquainted, whilst in Roumania the use of oil as fuel has become general during the last 10 years, and it is anticipated that considerable progress will be made in the near future; already the whole of the locomotives of the state railways burn oil. The Borneo, Java and Sumatra oil fields are supplying enormous quantities for consumption in India, Japan and Australia. The Shell Transport Company and the Royal Dutch Petroleum Company—in whose hands the sources of the last named supplies rest—are making every effort to

get oil fuel used wherever it can seriously compete with coal or wood. Entering upon the different descriptions of fuel, the author gave chemical analyses, and stated that Russian astatki had a calorific value of 19,890 British thermal units; Borneo and Texan oils were somewhat lower. Coal gas tar has a calorific value of 14,370 British thermal units.

Passing over the descriptions of different burners, we come to that part of the paper in which the author described certain results that had been arrived at. At Messrs. John Brown & Co.'s works, at Sheffield, with the Rusden and Eeles burner on a marine boiler with Serve tubes and retarders—the total heating surface being 1,200 square feet—16.09 pounds of water were evaporated per pound of Texan oil, the efficiency of the boiler being 84 per cent. This boiler was fitted with the Ellis and Eaves system of induced draught, working with 2¼ inches of vacuum at the fan suction. The boiler pressure was 150 pounds per square inch, and that of the steam used for the burners 60 pounds per square inch. With high pressure multitubular boilers fitted with the Holden apparatus, an equivalent evaporation of 15.5 pounds of water had been secured, whilst on locomotives in actual service 14.9 pounds of water per pound of oil was reached, and on marine boilers 15.2 pounds of water were evaporated per pound of oil. With water tube boilers having special furnaces, slightly higher figures were recorded. These results were secured when using heated air induced through the central cones of the burners, and without the assistance of additional plant. It would appear, however, that perfect as a burner might be as a spraying device, it was essential that the furnace should be properly designed for good results to be obtained; in fact, as much depended on the design of the furnace as on that of the burner.

The author stated that in the hydroleum furnace the formation had been very closely studied, and successful results had been obtained. In this furnace, as our readers are aware, a firebrick bridge is placed in the proper position in front of the nozzle, to receive the oil fuel spray and complete the mixing and atomizing. Experiments were recently made with a large marine type of Stirling water tube boiler, having a heating surface of 2,100 square feet, and a grate area of 62 5 square feet. With Welsh coal an equivalent evaporation of 10.55 pounds of water per pound of coal was obtained. The furnace was modified to use oil fuel through a row of 10 hydroleum feeders, working at a pressure of 30 pounds per square inch, the working pressure of the boiler being 150 pounds per square inch. With Texan oil an equivalent evaporation of 15.42 pounds per pound of fuel from and at 212° F. was obtained. In both tests ordinary marine uptakes were relied upon for draught. The author considered that with the best installations the efficiency of evaporation might be put at 15 pounds of water per pound of Texan fuel evaporated from and at 212° F.; any advance on this with the spray method of firing appeared difficult of attainment on ordinary lines.

The following points were given by the author as desirable with a view of obtaining higher efficiencies: (1) The oil fuel to be delivered to the burners under a pressure equal to that of the steam used for spraying, such steam to be fed to the nozzle as dry as possible, and with uniform pressure controlled by a suitable reducing valve; 50 pounds or 60 pounds per square inch appeared to be sufficient pressure. (2) The oil fuel to be supplied hot. A convenient apparatus is a combined steam pump and receiver, in which the exhaust steam is utilized to heat oil to 200° or 210° F. (3) Heated air for combustion should be procured by passing the air through suitable arrangements provided in the uptakes or flues. (4) The flues should be designed to secure a high temperature in the zone of combustion and a good distribution of heat generated. (5) A strong induced draught and suitable dampers and arrangements to properly control the air admission at the furnace front should be provided. In regard to the latter point, it was to be noted that the tendency had frequently been to admit too much air. For the best results, the exact amount requisite for good combustion only should be allowed to enter the furnace, and this may be thoroughly mixed with the oil; a powerful draught inducing a thin stream of air at the right point was much preferable to surplus air drawn in by a sluggish draught distributed all over the furnace.

The author illustrated his paper by exhibiting on the screen slides illustrating ships and locomotives fitted for burning liquid fuel. Some of the vessels were of large size and considerable power. There was also an illustration of the conveyance of liquid fuel by road, a steam wagon with a trailer being used. This method of transportation was adopted owing to the difficulty and expense incidental to railway carriage of liquid fuel. A Schwarz furnace was also shown on the screen. This was used, the author said, for brass smelting, and consisted of a globular firebrick lined chamber, in which the metal was melted by two converging oil jets urged by an air blast supplied from a blower, and conducted through one of the trunnions of the furnace. With this furnace crucibles were dispensed with, and from 500 pounds to 1,000 pounds of metal could be melted at one heat, thus securing a uniform quality for large castings. In concluding his paper, the author exclaimed against the random statements of some writers, inventors, and others who have been too enthusiastic supporters of liquid fuel. He said that such enthusiasm and avidity reminded one more of the tactics of the founders of a new religion than of the scientific discourse of men merely directing attention to the possibilities of employing a well known natural product as fuel for heating purposes.

Mr. Hawksley, in opening the discussion on the paper, said that oil fuel would be valuable for ocean going steamers on account of occupying space that could not otherwise be utilized. He would ask the author whether, in his comparison between the evaporative power of coal and oil fuel, he had taken into consideration the steam used in spraying the oil.

Professor Unwin bore testimony to the value of the paper and the large amount of information it contained. No doubt it would come as a surprise to others, as it had to him, to find the large extent to which oil fuel was used in other countries. When he was in Chicago he himself had seen 15,000-horse power being developed by the aid of oil fuel. A particularly pleasing circumstance about this was the cleanliness of the stokers, of whom there were very few, and who appeared to have nothing to do but walk around with their hands in their pockets, and look through a peep hole now and then into the furnace. Of course, such a happy state of affairs could not be brought about in this country, where there were no natural supplies of oil. In America, oil fuel could be supplied at a cost of a ¼d. a gallon. He had also been to a pumping station in America where it was found that oil was more economical to burn than coal at 15s. a ton. The figures that had been given showed that 1 indicated horse power could be obtained per hour by the consumption of 1 pound of oil; but if such oil were used in an internal combustion engine, 1 brake horse power would be developed by the burning of about ½ pound of oil. From this it would seem that the true use of oil fuel, so far as power purposes were concerned, was in the internal combustion engine, and not for burning in a boiler for raising steam.

In replying to the discussion, the author said that about 3 per cent. of the steam generated would be needed for spraying; 5 per cent. would be a bad figure. With perfect combustion there was no smell. He had travelled many miles on locomotives and steamers burning oil which gave no fumes that were objectionable. Of course, the internal combustion engine would be more economical than the steam engine; but until recently it was difficult to get an oil engine that would use heavy oil with facility; when such engines could be adopted steam would be out of the question.

Electrical Progress in Egypt.

By Mr. Henry L. Geissel, in *Elec. World.*

Electricity is penetrating more and more every quarter of the globe. Wherever conditions are favorable, the electric current is generated by water power and takes the place of steam. That this should be especially the case in countries poor in coal is but a matter of course, and whenever those countries, on the other hand, are privileged with an abundant presence of powerful waterfalls, the installation of electric power stations is assuming larger proportions all the time.

The writer visited last year a number of countries bordering the Mediterranean. He was surprised to find that the application of electricity, both for power and for lighting purposes, had made immense progress in Spain and Italy, and even on the Italian islands of the Mediterranean. However, this is but natural. Most of the countries in Southern Europe do not produce any quantities of coal worth mentioning, while they have at the same time wonderful hydraulic forces, and there is little doubt that these very same territories will offer in the near future a most valuable field for the sale of our surplus manufactures of all kinds of electrical machinery and appliances. But not only in countries which offer special opportunities for the introduction of electric power, but also in those which produce no coal, and are destitute of natural water power, electricity is making steady propress.

This is especially the case in the land of the Nile, where electricity has doubtless made better headway than in many European countries. Egypt may be regarded by the majority of American manufacturers and merchants as a market of little or no importance, but their attention may be drawn to the steadily and largely increasing imports to

prove it a field well deserving of their close study. With the opening up of the Dongola province, the imports in many lines of manufactured goods will go ahead with great strides, and there is plenty of chance for American firms to extend their operations to Egypt, provided they are prepared to do so in an enterprising spirit.

Comparing the population of Egypt with some other countries, it may be of interest to mention that it has about three times that of the whole of Central America, and in South America, Brazil is the only country which exceeds Egypt in population. American engineering enjoys the very best reputation in Egypt. The building of the Atbara bridge by American engineers, the supply of American locomotives for the Egyptian railways, and the considerable imports of agricultural machinery from the United States have largely contributed to this reputation.

Strange, therefore, that our electrical business, which a few years ago obtained some foothold on the Egyptian market, is now decreasing, while that of other nations is growing. The German consul-general at Cairo prepared recently an exhaustive, and, it may be added, highly interesting report on the present state of electricity in Egypt, and the following abstract from this official document will doubtless prove of interest to readers of the *Electrical World and Engineer*.

The physical conditions of Egypt, says the German official, do not in any way present special inducements for an extensive application of electricity, as the country does not possess any amount of hydraulic power which could be utilized. To generate current Egypt has to-day to avail herself of steam engines or other prime movers. In spite of this great drawback, electric light has not only penetrated such cities as Cairo and Alexandria, but has also made its appearance in the larger towns of the interior, such as Mansurah (34,000 inhabitants); Jantah (57,000); Zifta (14,000); Suez (25,000); Heluan (3,000), and Ismailia (7,000). Electric light is also about to be installed at Assiut (119,000 inhabitants); Fayoum (31,000); Yagaziz (32,000), and Demanhur (32,000).

In Cairo the Gas Company, by a contract entered into with the government in 1897, secured the exclusive right to supply electric light for a period of 30 years. The plant of this company is equipped with 6 steam engines of a total capacity of 12,000-horse power, driving 6 dynamos of an average capacity of 800 kw. In 1901 there were 1,230 customers using 7,000 lamps, an increase of 36 per cent. over the previous year. The underground cables had a length of 72,000 meters, and the current was supplied at the rate of 1 franc (20 cents) per kw-hour. At the expiration of the contract the entire system becomes government property. There are, besides, a number of private installations at Cairo, but all of them are of relatively little importance. Thus, for instance, the National Printing Office has a small plant which derives its power from a small 20-horse power steam engine generating current for light as well as for working the presses. Another little installation supplies light for the Abassije Hospital, situated in the suburbs of the city. The Vice-Royal Opera House possesses a plant with 2 dynamos feeding 850 incandescent lamps and 6 arc lights. Two of the larger hotels have also their own electric plant. As to private industrial enterprises outside of the city of Cairo, no statistical returns are available.

In the city of Alexandria it is also the local gas company which supplies the electric light. But there the plant is owned by the municipality, and it is in no way dependent upon the government. Neither Cairo nor Alexandria has a street lighting system. In this regard the two largest sities of Egypt are far behind some of the towns in the interior, where not only historic monuments, but also the streets and squares, are lighted by incandescent lamps. At Mansurah, Suez and Heluan English companies operate the electric plants, while at Ismailia a syndicate, chiefly composed of Swiss capitalists, furnish electricity to the town. The central power station at Mansurah feeds 373 lamps installed in public streets and about the same number of lamps for private individuals. In the streets of Heluan there are 200 lanterns, each of them provided with two incandescent lamps of 26-candle power. The plant at Heluan has been built in such a way as to be able to meet emergency demands, and during the winter season the plant also supplies three large hotels.

According to information furnished by the government authorities there will be built, for the towns of Jantah and Zifta, but one plant, at some place between the two cities; and this installation has, at the same time, to supply electric energy along the canal for the working of pumps and similar purposes. This plant is to generate tri-phase current at 10,000 volts, which, reduced by means of transformers, will be the first installation to transmit current over long distances ever constructed in the land of the Pyramids. For its lighting purposes the government is to pay $10 at Mansurah, $11 at Heluan, and $17.50 for the Jantah-Zifta system, per lamp per year.

Regarding motive power for industrial enterprises, it may be said that in this respect electricity has made relatively little headway so far in Egypt. As traction power, however, it is especially used on the tramways of Cairo and Alexandria, at the usual pressure of from 500 to 550 volts. The power station of the Cairo tramways, which, by the way, belongs to a Belgian Company, is equipped with four steam engines, each of from 350 to 400-horse power, and each of them coupled to dynamos of 200 kw. The length of the system, at the end of the year 1901, was 36 km, of which 21 km were double track. During the same year the rolling stock consisted of 94 motor cars and 59 trailer cars. In 1900 these tramways carried 11,225,000 paseengers, and in the following year 14,750,000, a daily average of 30,000 passengers for 1900, or 5.45 per cent. of the population of that year, as compared with a daily average of 40,000 passengers in 1901, or 7.07 per cent. of the population. In 1896 a concession was granted to this Company for a period of 50 years, thus expiring in 1946, when the entire system, including rolling stock, becomes government property. The Cairo tramways are capitalized at 6,000,000 francs; in 1900 the gross receipts amounted to 1,500,000 francs and rose to nearly 2,000,000 francs in 1901, while the total expenses did not exceed 52 per cent. of these gross earnings. The gross receipts, per car kilometer, were 0.65 and .054 franc respectively in 1900 and 1901.

The Cairo Gas Company employs for lighting purposes exclusiveiy single-phase alternating current, which is not adapted to run powerful motors. During the hot season, however, this current is extensively used for driving a great number of electrical fans. As far as large storage batteries are concerned, there were only 6 of them in Cairo at the end of 1901.

The above remarks show evidently that Egypt offers a favorable market for a large number of dynamos, especially for those of small and medium capacity, and furthermore for the sale of suitable motors. The chances for the sale of storage batteries are smaller. On the other hand, however, all kinds of supplies for electric lighting should find a ready sale. Up to some time ago, the dynamos used in Egypt were almost exclusively of English or Swiss origin, but the Cairo Tramways Company introduced American dynamos. It seems, however, that up to the present time German manufacturers still get the bulk of the trade. In steam engines the famous Sulzer Works, of Winterthur, Switzerland, are doing the largest amount of business. The writer saw Sulzer and Tosi (Legnano, Italy) steam engines all over Southern Europe last year. These two firms are doing an immense amount of business in the countries of the Mediterranean, and it must be admitted that their makes rank among the best in the world. In petroleum motors German and English manufacturers compete together, while in gas motors Germany still holds her own. On account of the high prices charged by the Cairo Gas Company, the chances for an increased sale of gas motors are not very great at present.

Lighting fixtures are largely imported from Germany. The latter country is making the most strenuous efforts to obtain a firm foothold on the Egyptian market, and two of the leading German electrical companies are already established in the country. There is little doubt that others will follow. It was only recently that the Allgemeine Elektricitäts Gesellschaft, of Berlin, secured an important order from the Egyptian Telephone Company, the headquarters of which are at London.

The order in question consisted of the laying of an underground telephone line between Cairo and Alexandria, and amounted to about $260,000. At the same time, in many quarters of Cairo, the overhead telephone lines had to be converted into underground lines, on account of grave disturbances having occurred after the completion of the Cairo-Alexandria underground telephone system. For this purpose armored steel cables, containing 100 double wires each, were employed. At the present time the Cairo underground telephone cables have a total length of a little over 20 km.

Another German firm, the Siemens & Halske Company, installed the necessary electrical equipments for the great Assuan dam, and also secured the order for the installation of an electric lighting plant at the Khartum barracks.

According to the official returns of the Egyptian custom house authorities, the imports of electrical appliances into Egypt amounted in value to $249,645 in 1899, $191,695 in 1900, and to $209,255 in 1901. In reality, however, the imports have been larger, as many machines being practically for electrical purposes are classified among other items. The official figures referred to above divide the imports of electrical appliances as follows:

	1899.	1900.	1901.
Germany	$64,735	$77,400	$115,495
Austria-Hungary	82,150	54,920	34,385
France	29,630	16,090	13,110
England	28,955	19,140	21,560
Italy	4,110	10,880	9,520
Sweden	945	1,635	11,040
United States	29,490	2,680	335

It will be seen from these figures that, while the imports from Germany and Sweden have considerably increased, those from other countries, and particularly from the United States, have largely decreased. The increase in the imports from Sweden is due to the fact that the telephone company of Cairo uses at present almost exclusively Swedish apparatus of the Ericsson make.

A Word to Exporters.

Electricity notes that American exporters very often judge the value of their goods and the needs of foreign purchasers by their own standard. This standard may be true as far as the conditions of the United States are concerned, and partly or entirely false when applied to other countries. The American manufacturer should know the requirements of the people whose trade he seeks, and should try to satisfy them. This is particularly true of the French market. The French have fixed habits, from which they do not easily change nor wish to change. Once satisfied with a certain manufactured product and thoroughly accustomed to it, they will not change, except from inability to obtain it, or for marked improvement in some new article, which must be clearly demonstrated. As in the United States, so in France, everybody wants the best; but the improved article or new product must be brought to the attention of the prospective purchaser in a very definite fashion.

Our manufacturers often expend their energies and their money in seeking to develop a foreign demand for their productions in a way far from practical. For instance, they send to France thousands of circulars during the year, printed in English, describing certain articles of export. These circulars fall into the hands of the proper dealers, but they cannot read them. Even were descriptive circulars printed in French and sent out to dealers, it would at best but prepare the mind of the French dealer for a commercial traveler. The traveler, unfortunately, does not follow the circular, and the energy is, to a great extent, lost. In view of existing modern trade bureaus and associations it would seem possible that one traveler could represent several firms manufacturing very diverse articles. By this means the French dealer could have what is necessary to successful business—a practical demonstration of the utility of any particular product.

Beyond question American manufacturers desirous of doing business in France must adapt themselves to the needs of the country. Not only should their trade literature be printed in French, but their correspondence should also be carried on in that language, while their traveling representatives in that country should also speak the language. The fact that neither buyer nor seller understands the other well causes at least hesitation and delay in reaching business.

The French think, and perhaps with more or less reason, that we are not always careful enough in our business methods. We send our manufactures to France, declaring that there are none better. This may be perfectly true from our point of view, but the natural richness of our country has rendered us more or less prodigal, and we have not made the careful study of economic value of certain products that has been made in France.

Our exporters, in order to further their own interests, should, as far as their relations with France are concerned, adapt their business to the metric system of weights and measures. There is nothing more annoying to a French purchaser than to be forced to make a reduction of our weights to the very reasonable and logical metric system. There is good reason to believe that our commercial relations with France can be greatly augmented by a better mutual understanding of business habits and the requirements of the market.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR. L. J. HOKE has resigned the position of Manager to the Chico (Cal.) Gas and Electric Company, in order to accept the place of Superintendent of Construction to the California Gas and Electric Company. His successor at Chico is Mr. A. J. Stephens, of San Francisco.

MR. C. F. COFFIN has resigned his position as President and General Manager of the Mohawk Gas Company, of Schenectady, N. Y. The Schenectady Railway Company having been absorbed by the General Electric Company, the entire lighting and railway service of Schenectady is now under the dominion of that concern, and a general rearrangement of the working force has been completed. Mr. E. F. Peck has been elected President of the gas division of the enterprise. Mr. H. W. Starr has been put in charge of the construction department, and Mr. G. F. Macmun is to act as superintendent of manufacture in the gas works' end.

MR. CHARLES A. SWEET, one of those prominent in organizing of the old Citizens Gas Light Company, of Buffalo, N. Y., and for many years President of that concern, died at his home in Buffalo the afternoon of the 1st inst. He was born in Hancock, Berkshire county, Mass., February 16, 1836, and settled in Buffalo in 1862, where he amassed a fortune, the foundation of which is traceable to his connection with the trade of transportation. He is survived by his wife, 3 sons and 2 daughters.

MR. E. M. WALKER has resigned the superintendency of the Dedham and Hyde Park (Mass.) Gas and Electric Light Company.

"L. R.," writing from Madison, Wis., under date of the 2d inst., says: "Mayor O'Hare, of Superior, Wis., has signed the new franchise under which the business of the Superior Water, Light and Power Company is to be carried on. The terms of the agreement, as far as rates go, are: On lighting account, $1.40 per 1,000; on fuel account, $1; for power use, 75 cents. If bills are not paid on or before the 15th of the month, the Company may add in each class the sum of 20 cents per 1,000. The old net rates were: On lighting account, $1.75; for fuel use, $1.25.

MR. JOSEPH H. COWELL, for 32 years in the employment of the old Albany (N. Y.) Gas Light Company, and its successor the Municipal Gas Company, died at his home in Albany the afternoon of the 29th ult.

A CORRESPONDENT in Portland, Me., writing under date of the 3d inst., forwards the following: "The Belfast Light and Power Company, has formally transferred its plant, real estate and other belongings to Messrs. N. Curtis Fletcher & Co., 131 Devonshire street, Boston, Mass., to whom the property was recently sold. The old Company ran the plant up to midnight of September 30, when the new proprietors assumed control. The business will be continued by a new Company recently organized at Portland, to be known as the Belfast Gas and Electric Company, with a capital stock of $60,000. Harry L. Cram, of Portland, is the President, and N. Curtis Fletcher, of Boston, the Treasurer. The new Company propose to improve the plant as soon as possible and to give its patrons satisfactory service for both light and power."

A RECENT issue of the Wilkes-Barre (Pa.) *News* had this to say: "The announcement has been made by the local Gas Company that the rate for gas will be advanced 10 cents per 1,000 cubic feet." At that the selling price will be only $1.10 per 1,000. General Manager Flanigan gives, as the reason for the increase, the great advances now ruling in the price of coal and oil.

MR. M. L. WELCKER has been elected Auditor for the South Hadley (Mass.) Gas Company.

A CORRESPONDENT informs us that the United States Coal & Coke Company, of Gary, W. Va., of which Thomas Lynch, of Pittsburg, is President, has completed the building of 1,000 coke ovens at the above place and has started work on 1,100 more. As soon as these 1,100 ovens have been finished, work on the building of another 1,100 will be started, as it is the intention to have a total of 3,200 ovens at this works. The output of these ovens is shipped to the Western plants of United States Steel Corporation, of which the United States Coal & Coke Company are an identified interest. The United States Coal & Coke Company has placed contracts for large additions to its electrical equipment. The present plant includes two 400-kw. 6,000-volt 3-phase 25-cycle generators, with cross simple engines, exciters and switchboards, supplying 3 sub-stations at mines. The addition includes 2 cross-compound, 1,200-horse power engines, two 750-kw. 6,000-volt generators, 50-kw. exciter set, switchboard, etc., 4 additional sub-station equipments, 9 induction motors, 40 to 50-horse power capacity, for driving fans and pumps, 5 mining locomotives and 16 electrical equipments for coke oven larries.

THE following interesting matter to holders of the "securities" of the Bay State Gas Company, of Delaware, is from the Boston *Herald* of the 3d inst.: "A branch of the gas controversies was discussed by counsel from legal points of view before Judge Braley in the Supreme Court yesterday to determine whether G. W. Pepper, the receiver of the Bay State Gas Company of Delaware, is legally entitled to maintain the bill which he has brought against the Boston Gas Light Company and

others, asking for 17 forms of relief, but mainly to set aside the sale by the Mercantile Trust Company, of New York, as trustee for United Gas bondholders, of the stocks in the Boston, the South Boston, the Roxbury and the Bay State (of Massachusetts) Companies, which had been pledged to secure those bonds, the purchaser being Messrs. Kidder, Peabody & Co. The sale brought $11,000,000 for the stocks, and a plan of reorganization of the situation in local affairs has since been begun. The discussion of the case was brought up on demurrers filed by several of the defendants. The plaintiff was represented by S. L. Whipple and Alexander Lincoln, while Boyd B. Jones appeared for Kidder, Peabody & Co. Messrs. Hemenway, Burrage and Hayden, and J. M. Beck, of New York, appeared for H. H. Rogers, another defendant. The bill complains that the sale of the stock in the Boston Companies last February by the Mercantile Trust Company, of New York, to Messrs. Kidder, Peabody & Co., was illegal, because it was based upon alleged fictitious defaults upon the part of the Boston Companies in the performance of their obligation to meet the interest and sinking fund requirements on United Gas bonds., under the trust agreement, and also because of alleged illegal terms imposed on the conditions of the sale. The defendants demur to the bill, alleging it cannot be maintained because it states no case for relief in equity, is multifarious, was too long delayed, is unauthorized by the United States Circuit Court for New Jersey, which appointed a receiver for the Bay State Gas Company of that State, and lacks proper parties. The bill is also claimed to lack equity, because it appears that the Boston Companies had not earned sufficient to meet the sinking fund and interest requirements prescribed by the trust agreement, and, therefore, it was the duty of the Mercantile Trust Company, of New York, as trustees for United Gas bondholders, to make a sale of the stocks in the local Companies to protect these bondholders. The defendants claim the directors could not be expected to pursue, if such a policy had been adopted and followed by former boards, the policy of hiring money for the sake of paying dividends that had not been earned. Mr. Whipple, counsel for the plaintiff, discussed the legal points raised by the counsel for the defendants at much length. and cited numerous legal authorities in support of his own contention that the bill was properly brought by the plaintiff, and that it stated a good case for the equitable intervention of the court which it sought, after which Judge Braley took ihe case under consideration on the demurrers."

THE proprietors of the Westerly-Hoppinton Railway Company have secured a controlling interest in the Pawcatuck Valley Street Railway and in the Westerly Gas and Electric Company, of Westerly, R. I.

THE new plant at Redding, Cal., will be completed by the 15th prox. The delay (the work should have been completed at least a fortnight ago) in finishing was occasioned by the strike of the boiler makers in Los Angeles.

MR. M. J. HIGLEY has resigned the superintendency of the Belvidere (Ills.) Gas and Electric Company to assume charge of the plant of the Iowa City (Ia.) Gas Light Company.

THE Fall River (Mass.) Gas Works Company has purchased a large tract of land on Birch street, the plot showing a suitable or an available frontage on Mount Hope Bay; and thus is the patient persistence of Manager Nute rewarded. The site is an excellent one and its absolute purchase foreshadows the construction of a plant that will enable the Company to do still better for itself and for its patrons.

THE improvements on the plant of the Adrian (Mich.) Gas Company will be completed by December 1st. The increase in the sendout at Adrian is astonishing even the owners of the plant.

THE Bloomington (Ills.) Gas Company is installed comfortably in its handsome, new office quarters, on North Main street. The new housings are in great contrast with the old shop on Front street, but it may not be truthfully denied that the Company had pretty good luck there. Let us hope (in fact we may believe) that the new will equal the old from the standpoint of the Treasurer.

THE capital stock of the People's Gas and Electric Company, of Defiance, O., has been increased to $150,000 from $100,000.

WE have it on good authority that no combination between the Omaha (Neb.) Gas Company and the Thomson-Houston Electric Light Company of the same city, is under serious consideration by the former.

MR. G. A. WIESE has been given "full powers to act" as Superintendent of the Alameda (Cal.) municipal electric light plant. He has a pretty hard task before him to keep matters moving smoothly.

AT the annual meeting of the South Hadley (Mass.) Gas Company the Directors chosen were: C. A. Cridley, H. F. Denklee, N. E. Preston, C. T. Snow and A. L. Wright; Clerk, G. W. Hubbard.

THE Portland (Me.) Gas Company experiences no difficulty in getting $5 per ton for its coke product.

THE Selectmen of Methuen, Mass., have awarded the public lighting of that place to the Lawrence Gas Company, in so far as the same is performed by means of gas.

THE service rendered by the Lowell (Mass.) Gas Light Company in the outlying village of Chelmsford (the piping thereof was completed this summer) is eminently satisfactory. Over 50 cooking ranges have been hooked up.

A CORRESPONDENT in San Francisco informs us that at a special meeting of the voters of Santa Ana, Cal., it was decided to authorize the municipality to issue bonds for the establishing and operating of an electric lighting plant.

THE latest concerning a probable gas works for Guthrie, Okla., is from a correspondent in that place, who writes under date of the 29th ult.: "H. S. Clark filed his acceptance yesterday of the gas franchise awarded him by the City Council recently. The acceptance was accompanied by the required $3,000 cash bond, which assures that the construction work on Guthrie's new coal gas plant will soon be commenced. In the contract with the city it is stipulated that the bond will be forfeited unless the following terms are complied with: The Company must begin work on the plant within 2 months after the awarding of the contract. In 4 months it must have $5,000 expended in labor and material on the ground. At the end of a year the plant must be in full operation and furnishing gas to the city. H. S. Clark, the promoter of the Company, is in Chicago, where he has been interesting a number of capitalists in the enterprise and that he has been successful is shown by the fact that he filed the $3,000 bond yesterday. Practically all of the stock has been subscribed and the cash is at hand for the purchasing of the material. In order to fulfill his part of the contract, Mr. Clark must let the contract for the building and purchase the material at once and it will be only a short time until Guthrie people can see something tangible of their promised gas plant."

THE plant in South Macalester, Indian Territory, was successfully put in operation the afternoon of the 29th ult. The Company starts with a good distributing system, over 10 miles of mains having been laid.

MR. RUDOLPH SPRECKELS is no longer a Director in the affairs of the San Francisco Gas and Electric Company. It is said that he resigned.

Engineering, in a note respecting the state of the English coal trade abroad, says: "Our export coal trade appears to have regained all its former elasticity; the effect of the export duty of 1s. per ton, imposed in April, 1901, being practically inappreciable, except perhaps upon the French market. The shipments in August were 3,840,319 tons, as compared with 3,573,091 tons in August, 1902, and 3,816,776 tons in August, 1901. When coke and patent fuel are included, the totals are carried to 3,960,065 tons, 3,711,528 tons, and 4,003,009 tons respectively. Coal was also shipped in August for the use of steamers engaged in foreign trade to the extent of 1,449,907 tons, as compared with 1,352,355 tons in August, 1902, and 1,200,800 tons in August, 1901. In the 8 months ending August 31, this year, our coal exports amounted to 29,743,175 tons, as compared with 27,588,766 tons in August, 1902, and 27,851,828 tons in August, 1901. These totals were increased by shipments of coke and patent fuel to 30,791,366 tons, 28,710,244 tons, and 29,080,628 tons respectively. Coal was also shipped in the first 8 months of this year for the use of steamers engaged in foreign trade to the extent of 10,939,195 tons, as compared with 9,885,812 tons in the first 8 months of 1902, and 8,936,937 tons in the first 8 months of 1901. In one way or another, coal has been leaving our shores this year at the rate of 62,595,841 tons per annum, while the corresponding movement for the corresponding period of 1901 did not exceed 57,026,347 tons per annum. The movement of British coal to the United States has not entirely ceased; but, at the same time, it appears to have practically spent itself, the shipments in that direction in August having been only 7,302 tons."

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHAS. E. SANDERSON,
MANAGER.

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NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS;

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, OCTOBER 12, 1903.

The Market for Gas Securities.

The general share market was characterized by marked weakness since time of last writing, some of the favorites in the speculative class (notably U. S. Steel) having made new low records.

In the trading gas shares naturally followed the general course of speculation, and lower prices ruled in Consolidated gas than those of a week ago. In connection with the latter stock, however, it is worthy of note that the volume of business, or the total number of shares reported sold, was smaller than for many weeks back. In fact, the only "busy day" in it for the week was to-day (Friday), when the total sales amounted to 1,145 shares, the range being from 171 on the high side to 169½ on the low, with the closing at 171. This scale would seem to indicate that operators in Consolidated for the bear end are virtually not doing much, which may be taken to mean that the low ebb in the stock had been reached. The Company's business grows at a rate that is nothing short of wonderful.

Brooklyn Union was dealt in yesterday to the extent of a 500-share lot, which was reported at 177½. If the sale were a genuine one the purchaser secured a cheap block.

Peoples, of Chicago, is steady, at the ridiculously low figure of 90½ to 90½, which is at least 25 points below its fair value.

Replying to an inquiry, we advise holders of Bay State, of Delaware, to cast their lot with the receiver.

The annual meeting of the Massachusetts Gas Companies will be held in Boston at 10 A.M. to-morrow. The market for gas bonds holds steady.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

OCTOBER 12.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	170½	172
Central Union, Bonds, 5's	3,000,000	1,000	105	108
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	118	120
Metropolitan	658,000	..	108	112
Mutual	3,500,000	100	280	295
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co. ..				
Bonds, 5's	11,000,000	1,000	104	106
Northern Union, Bonds, 5's.	1,250,000	1,000	105	106½
New York and East River				
Bonds 1st 5's	3,500,000	1,000	108	108
" 1st Con. 5's	1,500,000		109	111
Standard	5,000,000	100	135	140
Preferred	5,000,000	100	155	170
Bonds, 1st Mortgage, 5's	1,500,000	1,000	116	117
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	177	180
" " Bonds (5's)	15 000,000	1,000	119	119½
Bay State	50,000,000	50	⅛	¼
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works	450,000	100	28	30
" 1st Mtg. 5's	509,000	1,000	93	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	4	5
" " Bonds, 5's	5,256,000	1,000	73	76
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Central, San Francisco	1,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas & Elec. Co.	29,500,000	100	92½	93¾
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	101	101½
Columbus (O.) Gas Lt. & Heating Co	1,682,780	100	88¼	89¼
Preferred	3,026,500	100	107½	109
Consumers, Jersey City Bonds	600,000	1,000	100	102
Consumers, Toronto	1,700,000	50	218	225
Consolidated, Baltimore	11,000,000	100	62½	63
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	15	17
" Con. Mtg. 5's	880,000	1,000	85	87
Consolidated G. & E. Co.'s.				
Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co.	4,825,500	50	87	95
" Prior Lien 5's	5,603,000	1,000	99½	100
Detroit Gas Co., 5's	381,000	1,000	77	79
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	245	265
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	..	75
" Bonds, 6's	2,650,000	..	104¾	106
Jackson Gas Co	250,000	50	73	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	79	90
Preferred	2,500,000	100	84	..
Bonds	10,000,000	1,000	109½	110
Lafayette Gas Co., Ind.	1,000,000	100	..	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	136	140
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	107½	108½
" 6 per cent. scrip, due 1910	100,000	25	85	87
Montreal, Canada	2,000,000	100	218	184¾
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co	6,000,000	..	56	58
Bonds, 6's	4,600,000	..	105	105¾
New Haven	1,000,000	25	250	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	90¼	90½
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	0,000,000	100	..	..
St. Joseph Gas Co.				
" 1st Mtg. 5's	751,000	1,000	92	96½
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	92	93
Syracuse, N. Y.	1,975,000	100	46	48
Bonds	2,047.000	1,000	98½	99½
Washington, D. C	2,600,000	20	295	300
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	..	..	..
Wilmington, Del	600,000	50	232	..

Advertisers' Index.

GAS ENGINEERS. Page

A. E. Boardman, New York City ... 592
Baxter & Young, Detroit, Mich ... 592
B. E. Chollar, St. Louis, Mo ... 578
David Leavitt Hough, New York City ... 592
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 584
Frank D. Moses, Trenton, N. J ... 578
Fred. Bredel Co., Milwaukee, Wis ... 580
Geo. R. Rowland, New York City ... 582
Humphreys & Glasgow, New York City ... 593
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 592
The Gas Machinery Co., Cleveland, O ... 579
The Jeffrey Manufacturing Co., Columbus, O ... 590
The Western Gas Construction Co., Fort Wayne, Ind ... 560
United Gas Improvement Co., Philadelphia, Pa ... 587
Wm. Henry White, New York City ... 595

GAS WORKS APPARATUS AND CONSTRUCTION.

A. E. Boardman, New York City ... 592
Bartlett, Hayward & Co., Baltimore, Md ... 593
Baxter & Young, Detroit, Mich ... 592
Christopher Cunningham, Brooklyn, N.Y ... 589
Connelly Iron Sponge and Governor Co., New York City 543
Continental Iron Works, Brooklyn, N. Y ... 594
Cruse-Kemper Co., Philadelphia, Pa ... 579
Davis and Farnum Mfg. Co., Waltham, Mass ... 592
Deily & Fowler, Philadelphia, Pa ... 596
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 584
Frank D. Moses, Trenton, N. J ... 578
Fred. Bredel Co., Milwaukee, Wis ... 580
Humphreys & Glasgow, New York City ... 593
Isbell-Porter Company, New York City ... 594
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 592
Lloyd Construction Co., Detroit, Mich ... 582
Logan Iron Works, Brooklyn, N. Y ... 596
Quintard Iron Works, New York City ... 593
R. D. Wood & Co., Philadelphia, Pa ... 594
Riter-Conley Mfg. Co., Pittsburg, Pa ... 595
Stacey Mfg. Co., Cincinnati, O ... 595
The Connersville Blower Company, Connersville, Ind ... 597
The Gas Machinery Co., Cleveland, O ... 579
The Jeffrey Manufacturing Co., Columbus, O ... 590
The Western Gas Construction Co., Fort Wayne, Ind ... 560
United Gas Improvement Co., Philadelphia, Pa ... 587

PROCESSES.

Bartlett, Hayward & Co., Baltimore, Md..... 593
B. E. Chollar, St. Louis, Mo..... 578
Economical Gas Apparatus Construct'n Co, Toronto, Ont. 594
Humphreys & Glasgow, New York City..... 598
The Gas Machinery Co., Cleveland, O..... 579
The Western Gas Construction Co., Fort Wayne, Ind.... 560
United Gas Improvement Co., Philadelphia, Pa..... 587

SCRUBBERS AND CONDENSERS.

Continental Iron Works, Brooklyn, N.Y..... 594
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 584
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 592
Logan Iron Works, Brooklyn, N. Y..... 596
R. D. Wood & Co., Philadelphia, Pa..... 594
Riter-Conley Mfg. Co., Pittsburg, Pa..... 595
Stacey Mfg. Co., Cincinnati, O..... 595
The Gas Machinery Co., Cleveland, O..... 579
The Western Gas Construction Co., Fort Wayne, Ind.... 560

PRODUCER POWER PLANTS.

R. D. Wood & Co., Philadelphia, Pa..... 594

TAR AND CARBONIC ACID EXTRACTOR.

Economical Gas Apparatus Construct'n Co., Toronto, Ont. 584
Stacey Mfg. Co., Cincinnati, O..... 595
The Gas Machinery Co., Cleveland, O..... 579
The Western Gas Construction Co., Fort Wayne, Ind... 560

AMMONIA CONCENTRATORS.

Michigan Ammonia Works, Detroit, Mich..... 580
The Gas Machinery Co., Cleveland, O..... 579
The Western Gas Construction Co., Fort Wayne, Ind... 560

GAS METERS.

American Meter Co., New York and Philadelphia..... 599
Detroit Meter Company, Detroit, Mich..... 559
D. McDonald & Co., Albany, N.Y..... 597
Helme & McIlhenny, Philadelphia, Pa..... 599
John J. Griffin & Co., Philadelphia, Pa..... 600
Keystone Meter Co., Royersford, Pa..... 598
Maryland Meter and Mfg. Co., Baltimore, Md..... 598
Metric Metal Co., Erie, Pa..... 599
Nathaniel Tufts Meter Co., Boston, Mass..... 598

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia..... 599
D. McDonald & Co., Albany, N.Y..... 597
Helme & McIlhenny, Philadelphia, Pa..... 599
John J. Griffin & Co., Philadelphia, Pa..... 600
Keystone Meter Co., Royersford, Pa..... 598
Nathaniel Tufts Meter Co., Boston, Mass..... 598

PREPAYMENT METER ATTACHMENTS.

Reeves Mfg. Co., New Haven, Conn..... 580

GAS AND WATER PIPES.

Christopher Cunningham, Brooklyn, N.Y..... 589
Davis & Farnum Mfg. Co., Waltham, Mass..... 592
Donaldson Iron Co., Emaus, Pa..... 584
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 584
M. J. Drummond & Co., New York City..... 584
R. D. Wood & Co., Philadelphia, Pa..... 594
Warren Foundry and Machine Co., New York City..... 584

NON-RUSTING PIPE LUBRICANT.

Alan H. Tripp, Chicago, Ills..... 580

GAS COALS.

Berwind-White Coal Mining Co., New York and Phila. 590
Perkins & Co., New York City..... 590
Westmoreland Coal Co., Philadelphia, Pa..... 591

SPECIALTIES FOR OIL AND PIPE LINES.

S. R. Dresser, Bradford, Pa..... 581

GAS MAIN STOPPERS.

Safety Gas Main Stopper Co., N.Y. City..... 584

GAS TAPPING MACHINES.

George Light, Dayton, O..... 584
H. Mueller Manufacturing Company, Decatur, Ills..... 581

CANNEL COALS.

Perkins & Co., New York City..... 590

STOKING MACHINERY.

G. A. Bronder, New York City..... 589

AUTOMATIC WEIGHING MACHINERY.

Richardson Scale Co., New York City..... 580

CONVEYORS.

C. W. Hunt Company, New York City..... 581
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 584
G. A. Bronder, New York City..... 589
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 592
The Gas Machinery Co., Cleveland, O..... 579
The Jeffrey Manufacturing Co., Columbus, O..... 590
The Link-Belt Machinery Co., Chicago, Ills..... 591
The Western Gas Construction Co., Fort Wayne, Ind... 560

CHARGING BARROWS & COAL WAGONS.

Kerr Murray Mfg. Co., Fort Wayne, Ind..... 592
Stacey Mfg. Co., Cincinnati, O..... 595

GAS ENRICHERS.

Standard Oil Co., New York City..... 551
The Sun Oil Co., Pittsburg, Pa..... 591

COKE CRUSHERS.

C. M. Keller, Columbus, Ind..... 591
The Jeffrey Manufacturing Co., Columbus, O..... 590

STEAM BLOWER FOR BURNING BREEZE.

The Connersville Blower Company, Connersville, Ind... 597

ECONOMIZERS.

Green Fuel Economizer Co., Matteawan, N.Y..... 582

GAS GAUGES.

The Bristol Co., Waterbury, Conn..... 582

GAS GOVERNORS.

Connelly Iron Sponge and Governor Co., New York City 543
Isbell-Porter Co., New York City..... 594
R. D. Wood & Co., Philadelphia, Pa..... 594

CEMENTS.

C. L. Gerould, Galesburg, Ills..... 588

RETORTS AND FIREBRICKS.

Adam Weber Sons, New York City..... 588
Baltimore Retort and Firebrick Co., Baltimore, Md..... 588
Brooklyn Firebrick Works, Brooklyn, N. Y..... 588
Henry Maurer & Son, New York City..... 588
James Gardner, Jr., Co., Pittsburg, Pa..... 588
J. H. Gautier & Co., Jersey City, N. J..... 588
Laclede Firebrick Mfg. Co., St. Louis, Mo..... 588
Missouri Firebrick Co., St. Louis, Mo..... 588
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 578
The Kreischer Brick Mfg. Co., New York City..... 588

(*Continued on page 576.*)

DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., Sept. 9, 1903.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable Oct. 15th, 1903, to stockholders of record at the close of business, Sept. 30, 1903. Checks will be mailed.

1475-5 LEWIS LILLIE, Treasurer.

Situation Wanted

As Manager or Superintendent of Small Coal or Water Gas Plant,

By a man 45 years old. Successful and economical in operation and up to developing new business. Thoroughly practical and experienced in all branches. Progressive. First-class references given. Address, "S.,"

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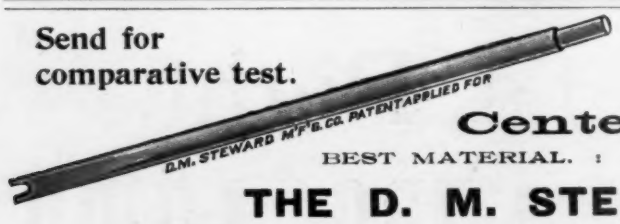

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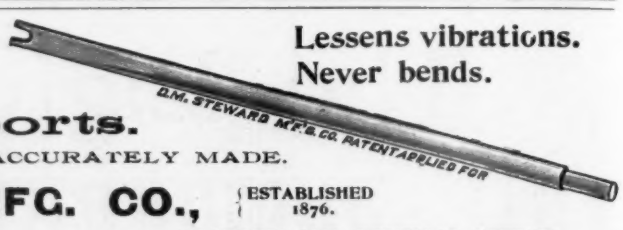

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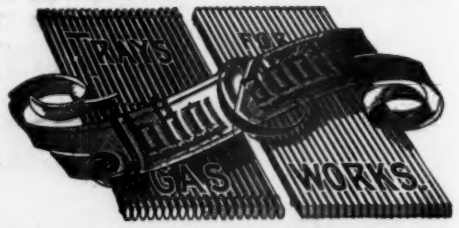

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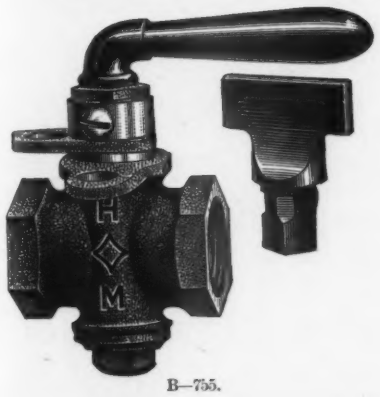

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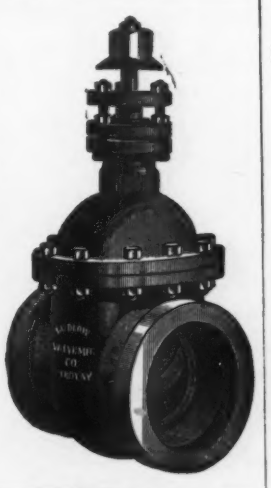

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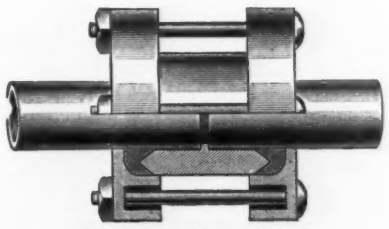

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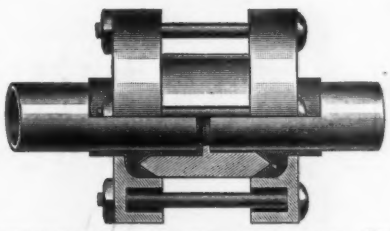
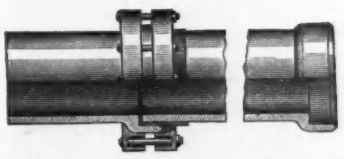
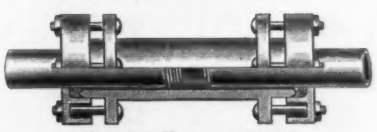


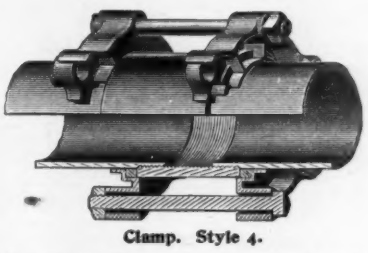
Insulating Coupling for Wrought Iron Pipe. Style 5.



Insulating Coupling for Dresser Bell and Spigot Cast Iron Pipe. Style 6.



Regular Sleeve. Style 2.



Clamp. Style 4.

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My Insulating Coupling prevents the destruction of pipe by electrolytic action, in either water or gas lines.

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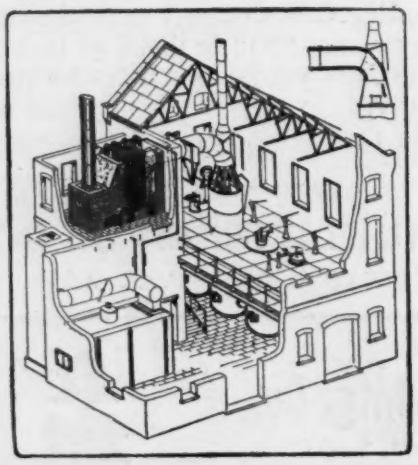

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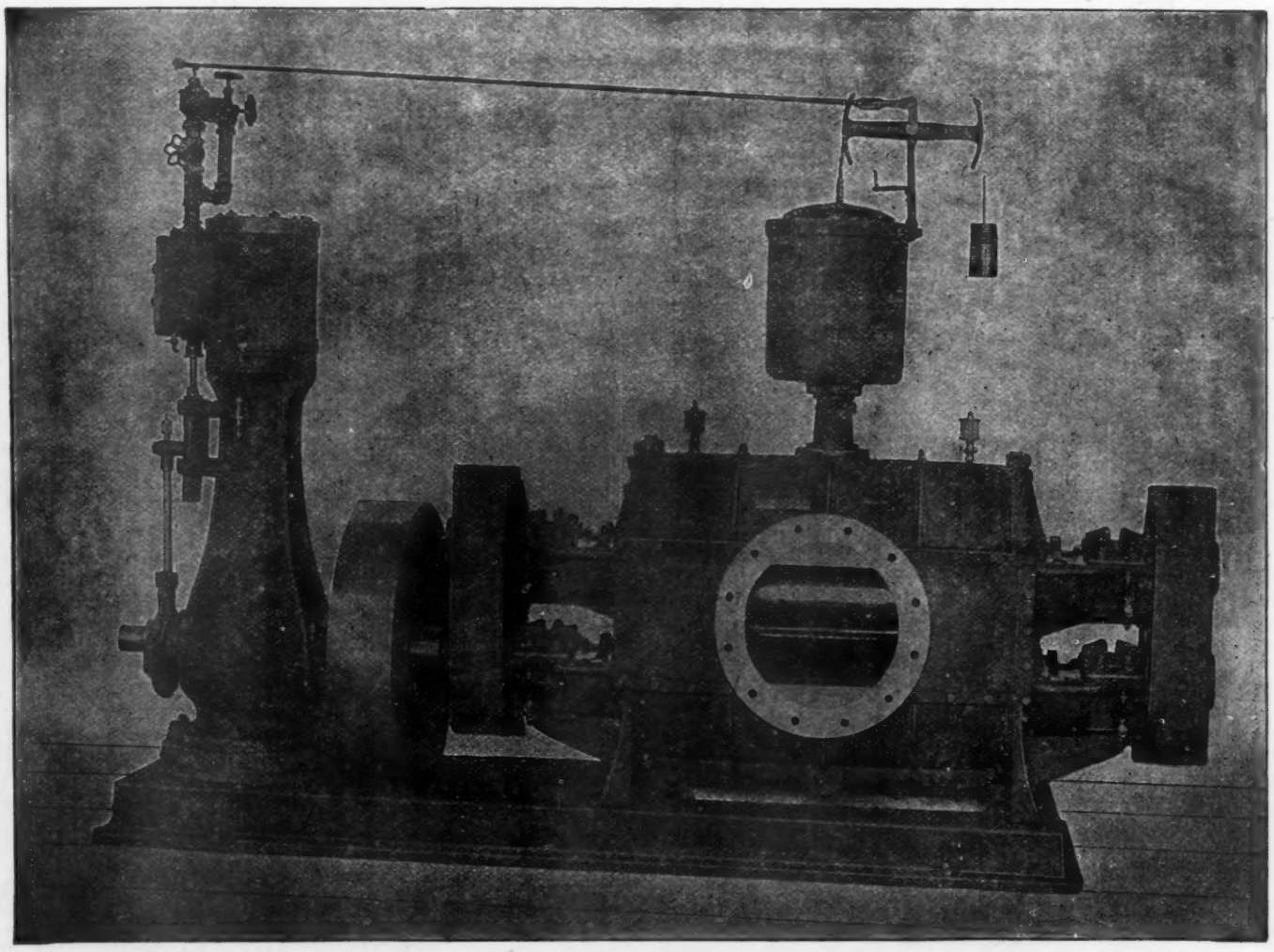

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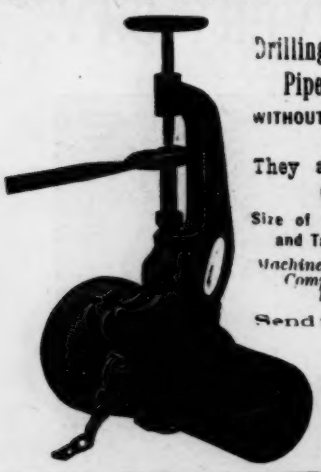

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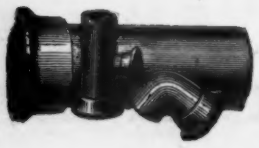

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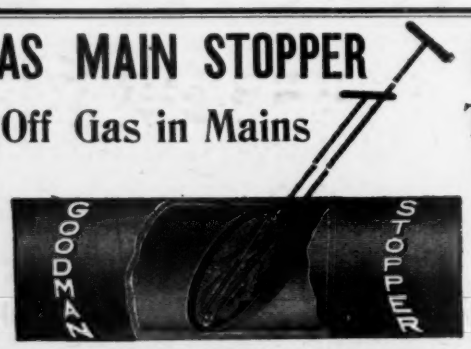

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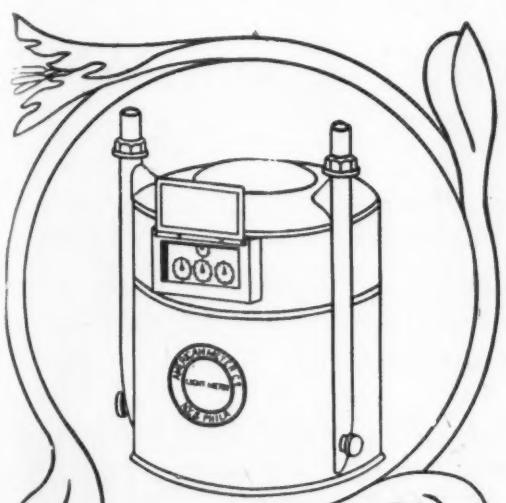
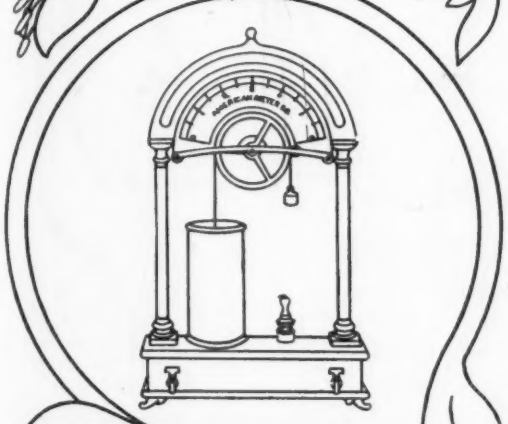
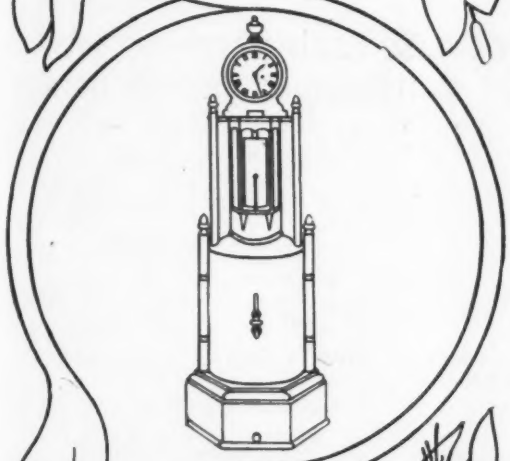
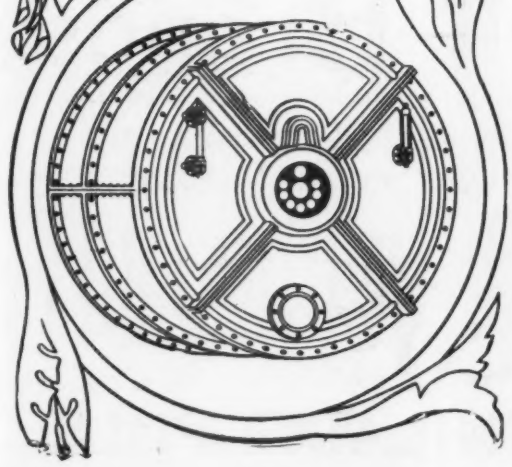




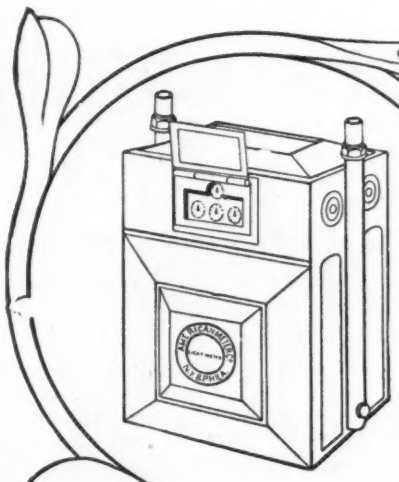


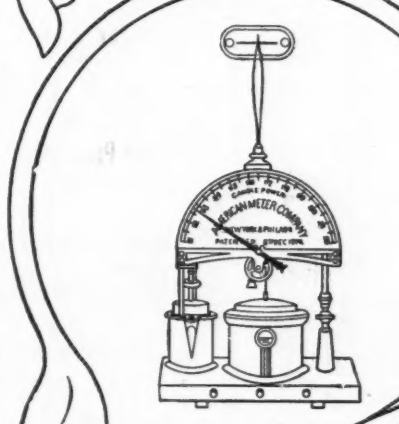


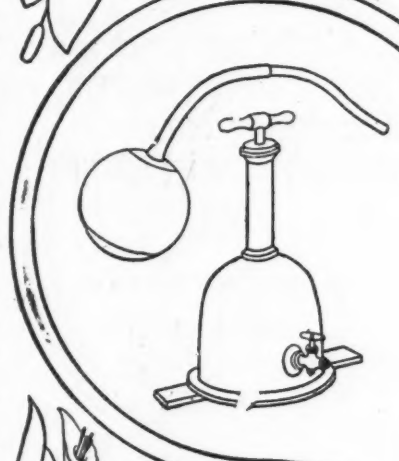
PUBLIC LIGHTING TABLE.

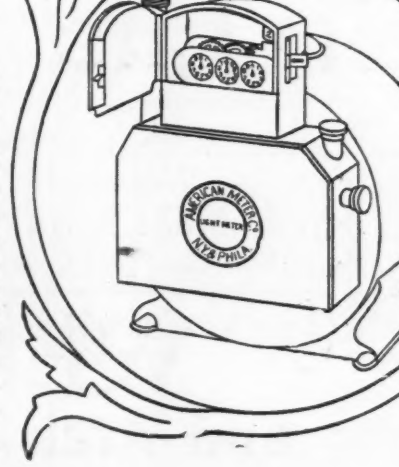
NOVEMBER, 1903.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Sun.	1	2.40 AM	5.30 AM	4.45	5.35
Mon.	2	3.40	5.30	4.45	5.35
Tue.	3	No L.	No L.	4.45	5.35
Wed.	4	No L. FM	No L.	4.45	5.35
Thu.	5	No L.	No L.	4.40	5.45
Fri.	6	5.20 PM	7.20 PM	4.40	5.45
Sat.	7	5 20	8.10	4.40	5.45
Sun.	8	5.20	9.10	4.40	5.45
Mon.	9	5.20	10.10	4.40	5.45
Tue.	10	5.20	11.10	4.40	5.45
Wed.	11	5.20 LQ	12.20 AM	4.40	5.45
Thu.	12	5.20	1.30	4.30	6.00
Fri.	13	5.20	2.40	4.30	6.00
Sat.	14	5.20	3.40	4.30	6.00
Sun.	15	5.10	5.50	4.30	6.00
Mon.	16	5.10	5.50	4.30	6.00
Tue.	17	5.10	5.50	4.30	6.00
Wed.	18	5.10 NM	5.50	4.30	6.00
Thu.	19	5.10	5.50	4.25	6.00
Fri.	20	5.10	5.50	4.25	6.00
Sat.	21	5.10	5.50	4.25	6.00
Sun.	22	5.10	6.00	4.25	6.00
Mon.	23	7.40	6.00	4.25	6.00
Tue.	24	8.40	6.00	4.25	6.00
Wed.	25	9.30	6.00	4.25	6.00
Thu.	26	10.30 FQ	6.00	4.20	6.10
Fri.	27	11.30	6.00	4.20	6.10
Sat.	28	12.20 AM	6.00	4.20	6.10
Sun.	29	1.20	6.00	4.20	6.10
Mon.	30	2.20	6.00	4.20	6.10









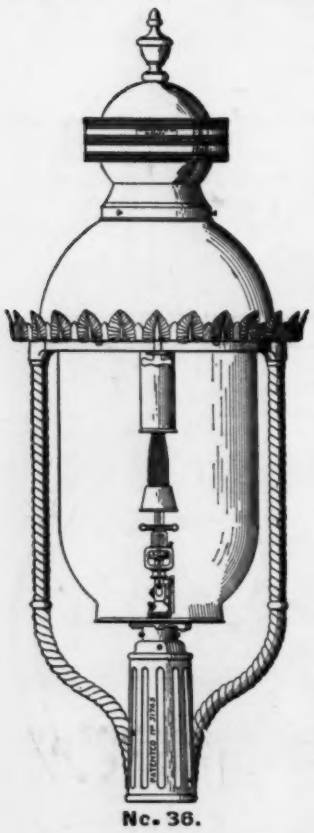
TOTAL HOURS LIGHTING DURING 1903.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January	245.00	January	423.20
February	192.00	February	355.25
March	201.00	March	355.35
April	167.20	April	298.50
May	152.00	May	264.50
June	131.00	June	234.25
July	140.40	July	243.45
August	156.20	August	280.25
September	171.20	September	321.15
October	198.20	October	374.30
November	216.30	November	401.40
December	232.10	December	433.45
Total, yr.	2203.40	Total, yr.	3987.45

NEW YORK, 33 Nassau Street. PHILADELPHIA, Broad and Arch Streets. CHICAGO, Foot of Orleans Street. BOSTON, 624 Tremont Building.
CLEVELAND, 809 Cuyahoga Building. ST. LOUIS, 712 Roe Building. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....



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The imitation stuff is bad for the customer---which is bad for you.

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Amesbury, Mass.	Lynn, Mass.	Savannah, Ga.
Aberdeen, S. D.	Newark, N. J.	New York (Central Union Co.)
Winsted, Conn.	Washington, D. C.	Cicero, Ills.
Canon City, Col.	Boone, Ia.	Chicago (Ogden Co.)
Schenectady, N. Y.	Pueblo, Col.	Easton, Pa.
Hagerstown, Md.	Charlotte, N. C.	Lawrence, Mass.
Malden, Mass.	Fall River, Mass.	Council Bluffs, Ia.
Bridgeport, Conn.	Duluth, Minn.	Chattanooga, Tenn.
Albert Lea, Minn.	New York (Mutual Co.)	

TOTAL SETS TO JULY 1, 1903, ... 51
TOTAL DAILY CAPACITY, ... 55,150,000 cubic feet.
TOTAL SETS TO DATE, ... 498
TOTAL DAILY CAPACITY, ... 354,830,000 cubic feet.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
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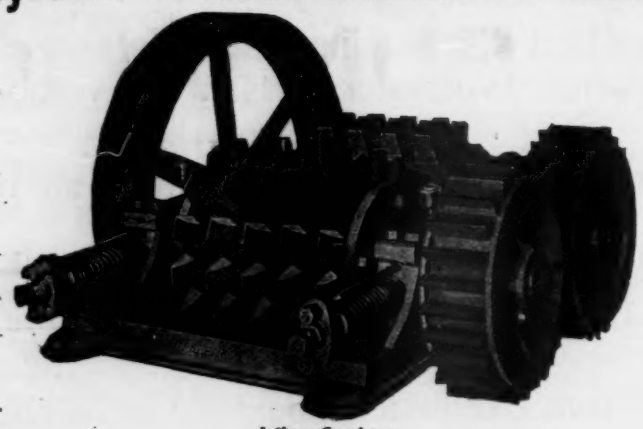

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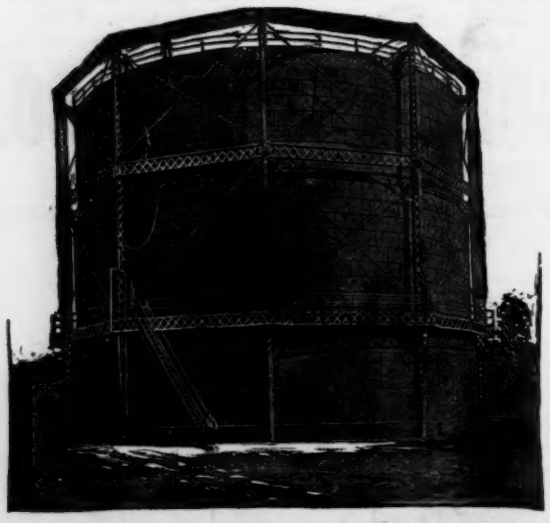

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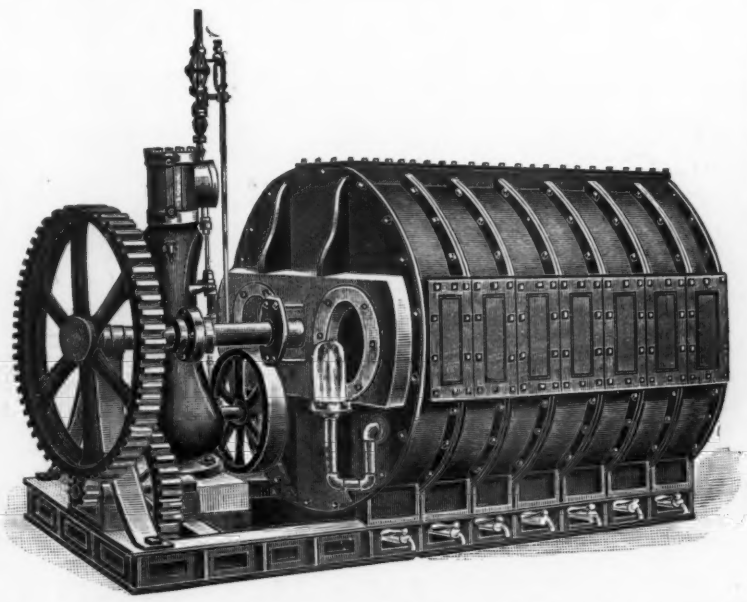

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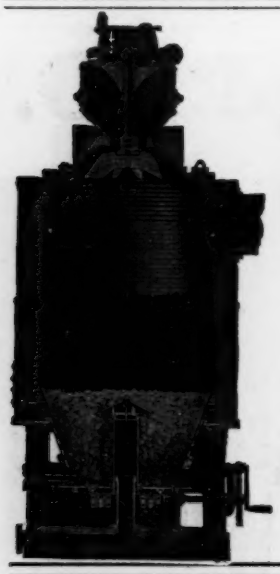

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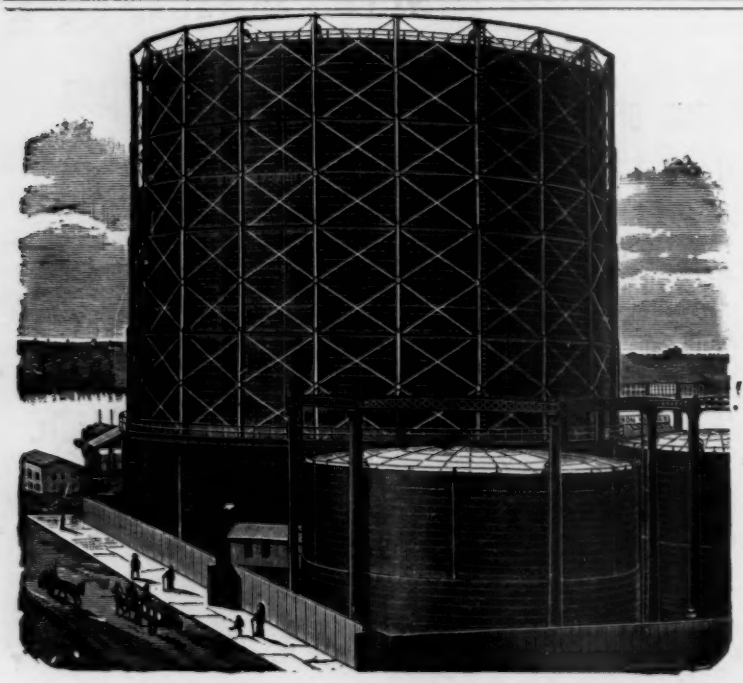

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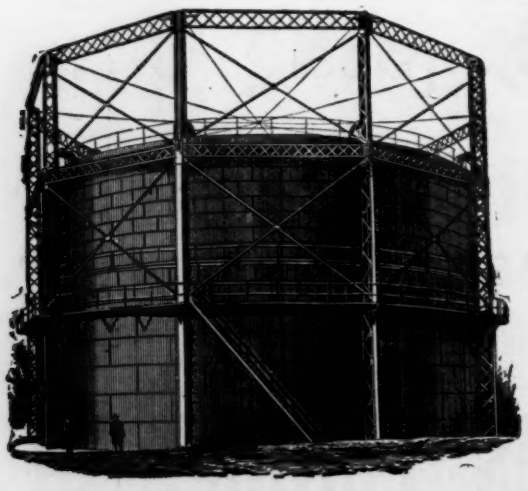

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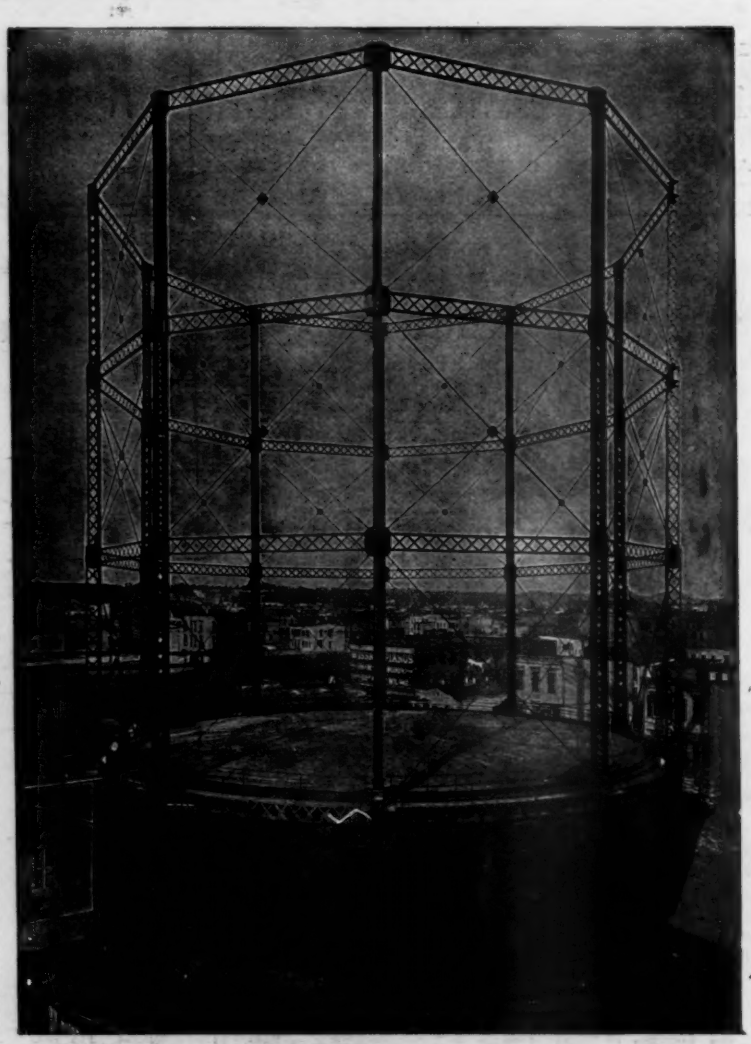

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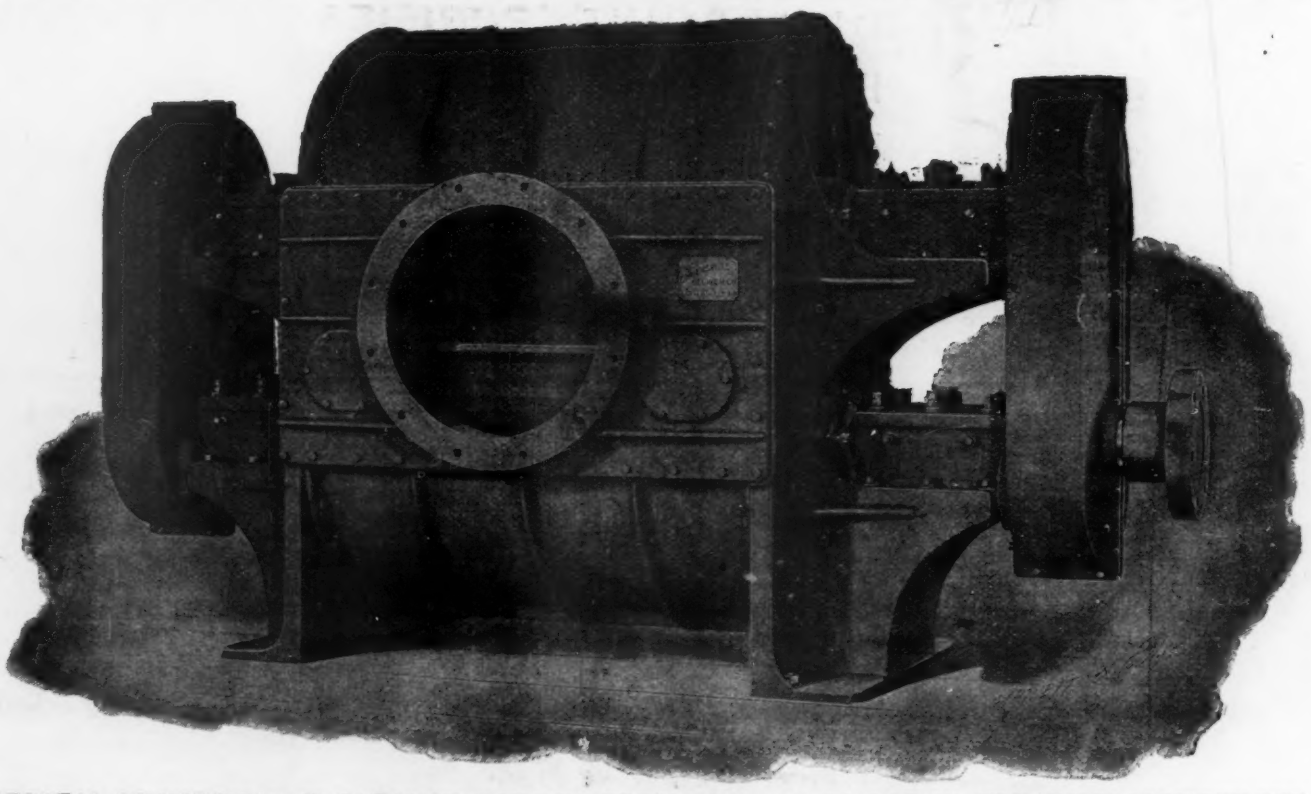

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